

Juan M. Lopez

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Academic Training:

- 1980 B.Sc. (First Class Honours) (Mathematics) Monash University, Australia.
- 1985 Ph.D. (Mathematics) Monash University, Australia.

Professional Appointments:

- 1985–1990 Research Scientist, Fluid Dynamics Group,
Defense Science and Technology Organisation (DSTO),
Aeronautical Research Laboratory, Melbourne, Australia.
- 1990–1993 Senior Research Scientist, Fluid Dynamics Group,
Defense Science and Technology Organisation (DSTO),
Aeronautical Research Laboratory, Melbourne, Australia.
- 1993–1998 Associate Professor, Department of Mathematics,
The Pennsylvania State University.
- 1998–2003 Associate Professor, Department of Mathematics,
Arizona State University.
- 2003— Professor, Department of Mathematics and Statistics,
Arizona State University.
- 2006— Affiliated Professor, Department of Mechanical and Aerospace Engineering,
Arizona State University.

Academic Honors and Professional Recognition:

George Garibaldi Turri Scholarship, 1976–1980.

Commonwealth Postgraduate Research Award, 1981–1984.

Visiting Scientist, Applied Aerodynamics Branch, NASA Ames Research Center (under auspices of The Technical Cooperation Program), August 1987–January 1989.

Defense Science and Technology Organisation Merit Promotion, 1990.

Visiting Fellow, Center for Turbulence Research, NASA Ames/Stanford University, July–August, 1992.

Visiting Professor, Department of Meteorology, The Pennsylvania State University, February–March 1993.

Visiting Professor, Department of Mechanical Engineering, University of Málaga, Málaga, Spain, May–June 1998.

Visiting Professor, Department of Applied Physics, Universitat Politècnica de Catalunya, Barcelona, Spain, June–July 1998–2003; May–October 2004; summers 2005–2007.

Visiting Scientist, Department of Mechanical Engineering, National University of Singapore, January–July 2005.

Principle Areas of Interest:

Hydrodynamic instabilities, nonlinear dynamics and bifurcation theory, interfacial hydrodynamics.

External Research Grants:

1. IBM Support of University Research Award “Instructional and research facilities for high performance computing,” \$275,000, 8/95–8/96 (Co-PI).
2. NSF ARI DMS-9512483 “Acquisition of a multi-processor computing facility for nonlinear mathematical field problems,” \$303,899, 9/95–9/98 (Co-PI).
3. NSF Computational Mathematics DMS-9706951 “Dynamic control and parametric resonance in hydrodynamic systems: A theoretical, computational, and experimental investigation,” \$94,000, 8/97–8/00 (PI; Co-PI: J. Shen).
4. NSF Fluid, Particulate and Hydraulic Systems CTS-9803683 “Dynamics of surfactant-influenced gas/liquid interfaces,” \$48,000, 7/98–3/02 (PI).
5. NSF International INT-9732637 “U.S.–Spain Cooperative Research: Dynamic control and parametric resonance in hydrodynamic systems,” \$16,267, 9/98–9/01 (PI; Co-PI: J. Shen).
6. NSF Fluid, Particulate and Hydraulic Systems CTS-9803683 “Research Experience for Undergraduates Supplement: Dynamics of surfactant-influenced gas/liquid interfaces,” \$6,875, 1/99–3/02 (PI).
7. NSF Fluid, Particulate and Hydraulic Systems CTS-9908599 “Spatial and temporal resonances in hydrodynamics: A theoretical, experimental, and numerical exploration,” \$180,000, 5/00–5/03 (PI; Co-PI: Saric).
8. NSF Fluid, Particulate and Hydraulic Systems CTS-0116995 “Effects of bulk flow on monolayer formation at gas/liquid interfaces,” \$15,000, 11/01–11/02 (PI).
9. Swiss NSF, Fellowships and Exchange Program P1012-100371 “Bifurcation Patterns of a Swirling Flow/Vortex Breakdown System,” 15,300SF, 03–05 (Co-PI).
10. NSF Fluid, Particulate and Hydraulic Systems CTS-0340736 “Collaborative research: The role of monolayer structure on interfacial hydrodynamics,” \$122,000 7/1/04–6/31/07 (PI).
11. NSF Fluid, Particulate and Hydraulic Systems CTS-0340736 “Research Experience for Undergraduates Supplement: The role of monolayer structure on interfacial hydrodynamics,” \$12,000 7/1/04–6/31/07 (PI).
12. Spanish Ministry of Education and Science, Euro30,000 9/1/04–7/31/05 (PI).
13. NSF Applied Mathematics DMS-0509594 “Collaborative research: Multiphase interfacial hydrodynamics,” \$57,893 7/1/05–6/31/08 (PI).
14. NSF Applied Mathematics DMS-05052705 “Stochastic parametric forcing in hydrodynamics,” \$294,390 9/15/05–9/14/08 (PI; Co-PI: Welfert)

Selected Refereed Journals Papers:

1. Murphy, J. O. & Lopez, J. M. “Magnetic Prandtl number and astrophysical convection,” *Proceedings Astronomical Society of Australia* **4**, 208–209 (1981).
2. Lopez, J. M. & Murphy, J. O. “Time dependent magnetoconvection with hexagonal planform,” *Proceedings Astronomical Society of Australia* **4**, 373–376 (1982).
3. Lopez, J. M. & Murphy, J. O. “The influence of the magnetic boundary conditions on the nature of astrophysical convection,” *Proceedings Astronomical Society of Australia* **5**, 172–173 (1983).
4. Lopez, J. M. & Murphy, J. O. “Time dependent thermal convection,” *Proceedings Astronomical Society Australia* **5**, 173–175 (1983).

5. Murphy, J. O. & Lopez, J. M. "The influence of vertical vorticity on thermal convection," *Australian Journal of Physics* **37**, 179–195 (1984).
6. Lopez, J. M. & Murphy, J. O. "Horizontal wave number dependence of type II solutions in Rayleigh-Benard convection with hexagonal planform," *Australian Journal of Physics* **37**, 531–547 (1984).
7. Lopez, J. M. & Murphy, J. O. "Multi-mode study of time-dependent thermal convection with hexagonal planform," *Proceedings Astronomical Society of Australia* **5**, 483–487 (1984).
8. Murphy, J. O. & Lopez, J. M. "The dynamics of steady hexagonal magnetoconvection," *Australian Journal of Physics* **38**, 41–62 (1985).
9. Lopez, J. M. & Murphy, J. O. "Time dependent multimode hexagonal magnetoconvection," *Proceedings Astronomical Society Australia* **6**, 227–231 (1985).
10. Lopez, J. M. & Murphy, J. O. "Dynamic time dependent hexagonal magnetoconvection," *Australian Journal of Physics* **38**, 885–910 (1985).
11. Murphy, J. O. & Lopez, J. M. "The onset of oscillatory instability in a rotating layer of mercury heated from below and subject to a magnetic field," *Proceedings Royal Society of London A* **407**, 313–324 (1986).
12. Yannios, N; Lopez, J. M. & Murphy, J. O. "A nonlinear bifurcation in cellular convection theory," *Proceedings Astronomical Society of Australia* **6**, 322–325 (1986).
13. Lopez, J. M. & Murphy, J. O. "Cell sizes at the onset of oscillatory convective instability in a layer of low-Prandtl-number fluid subject to rotation and a vertical magnetic field," *Quarterly Journal of Mechanics and Applied Mathematics* **40**, 303–314 (1987).
14. Murphy, J. O. & Lopez, J. M. "Evolution of a horizontal scale for magnetoconvection," *Proceedings Astronomical Society of Australia* **7**, 112–116 (1987).
15. Lopez, J. M. & Murphy, J. O. "Nonlinear bifurcations to time-dependent Rayleigh-Benard convection," *Australian Journal of Physics* **41**, 63–82 (1988).
16. Lopez, J. M. 1988 Vortex breakdown of a confined swirling flow. In *Computational Fluid Dynamics*; (eds. G. de Vahl Davis & C. Fletcher). pp. 493–501. North-Holland.
17. Lopez, J. M. "Axisymmetric vortex breakdown in an enclosed cylinder flow," *Lecture Notes in Physics* **323**, 384–388 (1989).
18. Murphy, J. O. & Lopez, J. M. "The evolution of a horizontal scale for oscillatory magnetoconvection," *Proceedings Astronomical Society of Australia* **8**, 25–28 (1989).
19. Lopez, J. M. "Axisymmetric vortex breakdown: Part 1. Confined swirling flow," *Journal of Fluid Mechanics* **221**, 533–552 (1990).
20. Brown, G. L. & Lopez, J. M. "Axisymmetric vortex breakdown: Part 2. Physical mechanisms," *Journal of Fluid Mechanics* **221**, 553–576 (1990).
21. Lopez, J. M. & Perry, A. D. "Axisymmetric vortex breakdown: Part 3. Onset of periodic flow and chaotic advection," *Journal of Fluid Mechanics* **234**, 449–471 (1992).
22. Lopez, J. M. & Perry, A. D. "Periodic axisymmetric vortex breakdown in a cylinder with a rotating end wall," *Physics of Fluids A* **4**, 1871 (1992).
23. Murphy, J. O., Lopez, J. M. & Dyt, C. P. "The effect of magnetic-field strength on the oscillatory characteristics of multimode magnetoconvection," *Proceedings Astronomical Society of Australia* **10**, 275–277 (1993).
24. Lopez, J. M. & Bulbeck, C. J. "Behaviour of streamwise rib vortices in a three-dimensional mixing layer," *Physics of Fluids A* **5**, 1694–1702 (1993).

25. Lopez, J. M. “On the bifurcation structure of axisymmetric vortex breakdown in a constricted pipe,” *Physics of Fluids* **6**, 3683–3693 (1994).
26. Lopez, J. M. “Unsteady swirling flow in an enclosed cylinder with reflectional symmetry,” *Physics of Fluids* **7**, 2700–2714 (1995).
27. Lopez, J. M. “Flow between a stationary and a rotating disk shrouded by a co-rotating cylinder,” *Physics of Fluids* **8**, 2605–2613 (1996).
28. Henderson, D. M., Lopez, J. M., & Stewart, D. L. “Vortex evolution during non-axisymmetric spin-up,” *Journal of Fluid Mechanics* **324**, 109–134 (1996).
29. Lopez, J. M. & Weidman, P. D. “Stability of stationary endwall boundary layers during spin-down,” *Journal of Fluid Mechanics* **326**, 373–398 (1996).
30. Marques, F. & Lopez, J. M. “Taylor–Couette flow with axial oscillations of the inner cylinder: Floquet analysis of the base flow,” *Journal of Fluid Mechanics* **348**, 153–175 (1997).
31. Lopez, J. M. & Shen, J. “An efficient spectral-projection method for the Navier-Stokes equations in cylindrical geometries. I. Axisymmetric cases,” *Journal of Computational Physics* **139**, 308–326 (1998).
32. Lopez, J. M. “Characteristics of endwall and sidewall boundary layers in a rotating cylinder with a differentially rotating endwall,” *Journal of Fluid Mechanics* **359**, 49–79 (1998).
33. Lopez, J. M. & Shen, J. “Numerical simulation of incompressible flows in cylindrical geometries using a spectral projection method,” *International Journal of Applied Science and Computations* **5**, 25–40 (1998).
34. Lopez, J. M. & Hirska, A. “Direct determination of the dependence of the surface shear and dilatational viscosities on the thermodynamic state of the interface: Theoretical foundations,” *Journal of Colloid and Interface Science* **206**, 231–239 (1998).
35. Lopez, J. M. & Chen, J. “Coupling between a viscoelastic gas/liquid interface and a swirling vortex flow,” *Journal of Fluids Engineering* **120**, 655–661 (1998).
36. Lopez, J. M. & Shen, J. “A numerical study of periodically forced flows using a spectral-projection method,” *Lecture Notes in Physics* **515**, 189–194 (1999).
37. Stevens, J. L., Lopez, J. M. & Cantwell, B. J. “Oscillatory flow states in an enclosed cylinder with a rotating endwall,” *Journal of Fluid Mechanics* **389**, 101–118 (1999).
38. Lopez, J. M. & Marques, F. “Determining the self-rotation number following a Naimark–Sacker bifurcation in the periodically forced Taylor–Couette flow,” *Journal of Applied Mathematics and Physics (ZAMP)* **51**, 61–74 (2000).
39. Marques, F. & Lopez, J. M. “Spatial and temporal resonances in a periodically forced extended system,” *Physica D* **136**, 340–352 (2000).
40. Lopez, J. M. & Marques, F. “Quasiperiodic responses to parametric excitations,” In *Numerical Methods for Bifurcation Problems and Large-Scale Dynamical Systems* (eds. E. Doedel & L. Tuckerman) IMA Volumes in Mathematics and its Applications **119**, 209–228 (Springer) (2000).
41. Talmage, G., Shyu, S.-H., Lopez, J. M. & Walker, J. S. “Inertial effects in the rotationally driven melt motion during the Czochralski growth of silicon crystals with a strong axial magnetic field,” *Journal of Applied Mathematics and Physics (ZAMP)* **51**, 267–289 (2000).
42. Lopez, J. M., Marques, F. & Shen, J. “Endwall effects in a periodically forced centrifugally unstable flow,” *Fluid Dynamics Research* **27**, 91–108 (2000).

43. Brummell, N., Hart, J. E. & Lopez, J. M. “On the flow induced by centrifugal buoyancy in a differentially-heated rotating cylinder,” *Theoretical and Computational Fluid Dynamics* **14**, 39–54 (2000).
44. Lopez, J. M. & Marques, F. “Dynamics of 3-tori in a periodically forced Navier-Stokes flow,” *Physical Review Letters* **85**, 972–975 (2000).
45. Lopez, J. M. & Hirska, A. H. “Surfactant influenced gas/liquid interfaces: Nonlinear equation of state and finite surface viscosities,” *Journal of Colloid and Interface Science* **229**, 575–583 (2000).
46. Hirska, A., Lopez, J. M., & Kim, S. “Evolution of an initially columnar vortex terminating normal to a no-slip wall,” *Experiments in Fluids* **29**, 309–321 (2000).
47. Blackburn, H. M. & Lopez, J. M. “Symmetry breaking of the flow in a cylinder driven by a rotating endwall,” *Physics of Fluids* **12**, 2698–2701 (2000).
48. Marques, F. & Lopez, J. M. “Precessing vortex breakdown mode in an enclosed cylinder flow,” *Physics of Fluids* **13**, 1679–1682 (2001).
49. Marques, F., Lopez, J. M. & Shen, J. “A periodically forced flow displaying symmetry breaking via a three-tori gluing bifurcation and two-tori resonances,” *Physica D* **156**, 81–97 (2001).
50. Lopez, J. M., Marques, F. & Sanchez, J. “Oscillatory modes in an enclosed swirling flow,” *Journal of Fluid Mechanics* **439**, 109–129 (2001).
51. Hirska, A. H., Lopez, J. M. & Miraghaie, R. “Measurement and computation of hydrodynamic coupling at an air/water interface in the presence of an insoluble monolayer,” *Journal of Fluid Mechanics* **443**, 271–292 (2001).
52. Lopez, J. M. & Hirska, A. H. “Oscillatory driven cavity with an air/water interface and an insoluble monolayer: Surface viscosity effects,” *Journal of Colloid and Interface Science* **242**, 1–5 (2001).
53. Lopez, J. M. & Hirska, A. H. “Non-Newtonian behavior of an insoluble monolayer: Effects of inertia,” *Journal of Colloid and Interface Science* **248**, 103–110 (2002).
54. Lopez, J. M., Marques, F. & Shen, J. “An efficient spectral-projection method for the Navier-Stokes equations in cylindrical geometries. II. Three dimensional cases,” *Journal of Computational Physics* **176**, 384–401 (2002).
55. Marques, F., Lopez, J. M. & Shen, J. “Mode interactions in an enclosed swirling flow: a double Hopf bifurcation between azimuthal wavenumbers 0 and 2,” *Journal of Fluid Mechanics* **455**, 263–281 (2002).
56. Hirska, A. H., Lopez, J. M. & Miraghaie, R. “Symmetry breaking to a rotating wave in a lid-driven cylinder with a free surface: Experimental observation,” *Physics of Fluids* **14**, L29–L32 (2002).
57. Marques, F., Lopez, J. M. & Iranzo, V. “Imperfect gluing bifurcation in a temporal glide-reflection symmetric Taylor-Couette flow,” *Physics of Fluids* **14**, L33–L36 (2002).
58. Liu, Z., Lai, Y.-C. & Lopez, J. M. “Noise-induced enhancement of chemical reactions in chaotic flows,” *Chaos* **12**, 417–425 (2002).
59. Lopez, J. M., Hart, J. E., Marques, F., Kittelman, S. & Shen, J. “Instability and mode interactions in a differentially-driven rotating cylinder,” *Journal of Fluid Mechanics* **462**, 383–409 (2002).
60. Sanchez, J., Marques, F. & Lopez, J. M. “A continuation and bifurcation technique for Navier-Stokes flows,” *Journal of Computational Physics* **180**, 78–98 (2002).

61. Blackburn, H. M. & Lopez, J. M. “Modulated rotating waves in an enclosed swirling flow,” *Journal of Fluid Mechanics* **465**, 33–58 (2002).
62. Hirsa, A. H., Lopez, J. M. & Miraghaie, R. “Determination of surface shear viscosity via deep-channel flow with inertia,” *Journal of Fluid Mechanics* **470**, 135–149 (2002).
63. Lopez, J. M. & Marques, F. “Modulated Taylor-Couette flow: Onset of spiral modes,” *Theoretical and Computational Fluid Dynamics* **16**, 59–69 (2002).
64. Vogel, M., Hirsa, A. H. & Lopez, J. M. “Spatio-temporal dynamics of a periodically driven cavity flow,” *Journal of Fluid Mechanics* **478**, 197–226 (2003).
65. Miraghaie, R., Lopez, J. M. & Hirsa, A. H. “Flow induced patterning at the air/water interface,” *Physics of Fluids* **15**, L45–L48 (2003).
66. Blackburn, H. M. and Lopez, J. M. “On three-dimensional quasi-periodic Floquet instabilities of two-dimensional bluff body wakes,” *Physics of Fluids* **15**, L57–L60 (2003).
67. Marques, F., Gelfgat, A. Yu. and Lopez, J. M. “A tangent double Hopf bifurcation in a differentially rotating cylinder flow,” *Physical Review E* **68**, 016310 (2003).
68. Lopez, J. M. and Marques, F. “Short annulus Taylor-Couette flow: Onset of a very-low-frequency three-torus state,” *Physical Review E* **68**, 036302 (2003).
69. Blackburn, H. M. and Lopez, J. M. “The onset of three-dimensional standing and modulated travelling waves in a periodically-driven cavity flow,” *Journal of Fluid Mechanics* **497**, 289–317 (2003).
70. Marques, F., Lopez, J. M. and Blackburn, H. M. “Bifurcations in systems with Z_2 spatio-temporal and $O(2)$ spatial symmetry,” *Physica D* **189**, 247–276 (2004).
71. Lopez, J. M., Marques, F. and Shen, J. “Complex dynamics in a short Taylor-Couette annulus with the top endwall stationary and the bottom rotating,” *Journal of Fluid Mechanics* **501**, 327–354 (2004).
72. Lopez, J. M. and Marques, F., Hirsa, A. H. and Miraghaie, R. “Symmetry breaking in free-surface cylinder flows,” *Journal of Fluid Mechanics* **502**, 327–354 (2004).
73. Lopez, J. M. and Marques, F. “Mode competition between rotating waves in a swirling flow with reflection symmetry,” *Journal of Fluid Mechanics* **507**, 265–288 (2004).
74. Vogel, M. J., Miraghaie, R., Lopez, J. M. and Hirsa, A. H. “Flow-induced patterning of Langmuir monolayers,” *Langmuir* **20**, 5651–5654 (2004).
75. Iranzo, V., Marques, F. and Lopez, J. M. “From global to local bifurcations in a forced Taylor-Couette flow,” *Theoretical and Computational Fluid Dynamics* **18**, 115–128 (2004).
76. Lopez, J. M., Vogel, M. J. and Hirsa, A. H. “Influence of coexisting phases on the surface dilatational viscosity of Langmuir monolayers,” *Physical Review E* **70**, 056308 (2004).
77. Blackburn, H. M., Marques, F. and Lopez, J. M. “Symmetry breaking of two-dimensional time-periodic flows,” *Journal of Fluid Mechanics* **522**, 395–411 (2005).
78. Leung, J. J. F., Hirsa, A. H., Blackburn, H. M., Marques, F. and Lopez, J. M. “Three-dimensional modes in a periodically driven elongated cavity,” *Physical Review E* **71**, 026305 (2005).
79. Abshagen, J., Lopez, J. M., Marques, F. and Pfister, G. “Symmetry breaking via global bifurcations of two tori in hydrodynamics,” *Physical Review Letters* **94**, 074501 (2005).
80. Abshagen, J., Lopez, J. M., Marques, F. and Pfister, G. “Mode competition of rotating waves in reflection-symmetric Taylor-Couette flow,” *Journal of Fluid Mechanics* **540**, 269–299 (2005).

81. Lopez, J. M. and Marques, F. “Finite aspect ratio Taylor-Couette flow: Shil’nikov dynamics of 2-tori,” *Physica D* **211**, 168–191 (2005).
82. Lopez, J. M. “Rotating and modulated rotating waves in transitions of an enclosed swirling flow,” *Journal of Fluid Mechanics* **553**, 323–346 (2006).
83. Marques, F. and Lopez, J. M. “Onset of three-dimensional unsteady states in small aspect-ratio Taylor-Couette flow,” *Journal of Fluid Mechanics* **561**, 255–277 (2006).
84. Lopez, J. M., Rubio, A. and Marques, F. “Traveling circular waves in axisymmetric rotating convection,” *Journal of Fluid Mechanics* **69**, 331–348 (2006).
85. Lopez, J. M., Cui, Y. D. and Lim, T. T. “An experimental and numerical investigation of the competition between axisymmetric time-periodic modes in an enclosed swirling flow,” *Physics of Fluids* **18**, 104106 (2006).
86. Hirska, A. H., Lopez, J. M., Vogel, M. J. and Leung, J. J. F. “Effects of shearing flow with inertia on monolayer mesoscale structure,” *Langmuir* **22**, 9483–9486 (2006).
87. Marques, F., Mercader, I., Batiste, O. and Lopez, J. M. “Centrifugal effects in rotating convection: Axisymmetric states and three-dimensional instabilities,” *Journal of Fluid Mechanics* **580**, 303–318 (2007).
88. Azadani, A. N., Lopez, J. M. and Hirska, A. H. “Protein crystallization at the air/water interface induced by shearing bulk flow,” *Langmuir* **23**, 5227–5230 (2007).
89. Allen, J. J. and Lopez, J. M. “Transition processes for junction vortex flow,” *Journal of Fluid Mechanics* **585**, 457–467 (2007).
90. Lopez, J. M., Marques, F., Mercader, I. and Batiste, O. “Onset of convection in a moderate aspect-ratio rotating cylinder: Eckhaus-Benjamin-Feir instability,” *Journal of Fluid Mechanics*, (accepted).
91. Avila, M., Marques, F., Lopez, J. M. and Meseguer, A. “Stability control and catastrophic transition in a forced Taylor-Couette system,” *Journal of Fluid Mechanics*, (accepted).

Invited Colloquia and Seminars:

1. Sep ‘86: Department of Mathematics, Monash University, Australia.
2. Oct ‘86: Director’s Seminar, Aeronautical Research Laboratory, Australia. “Axisymmetric vortex breakdown: A comparison between experimental visualization and numerical simulation.”
3. Apr ‘88: Department of Mechanical Engineering, Stanford University, CA.
4. May ‘88: Review seminar, High Angle of Attack Project, NASA Ames Research Center, CA.
5. Nov ‘88: Department of Mechanical Engineering, University of California, Davis, CA.
6. Feb ‘89: Royal Aerospace Establishment, Farnborough, UK.
7. Feb ‘89: School of Aeronautics, Polytechnic University of Madrid, Spain.
8. Apr ‘89: Flight Mechanics and Propulsion Division Seminar, Aeronautical Research Laboratory, Australia.
9. Sep ‘90: NASA Langley Research Center, VA.
10. May ‘91: Flight Mechanics and Propulsion Division Seminar, Aeronautical Research Laboratory, Australia.

11. Jun '91: Department of Mechanical Engineering, University of Melbourne, Australia.
12. Aug '91: Bureau of Meteorology Research Centre, Victoria, Australia.
13. Nov '91: Graduate Aeronautics Laboratory, California Institute of Technology, CA.
14. Aug '92: Department of Mechanical Engineering, The Pennsylvania State University, PA.
15. Aug '93: Department of Mathematics, The Pennsylvania State University, PA. "Some aspects of axisymmetric vortex breakdown."
16. Dec '93: Department of Mechanical Engineering, Monash University, Australia. "On the nature of the onset of periodic swirling flow."
17. Mar '94: Department of Mechanical Engineering, Clarkson University, NY. "Bifurcation structure of swirling flows."
18. Dec '94: Department of Mechanical Engineering, Lehigh University, PA. "Vortex line bending in axisymmetric swirling flows."
19. Sep '95: Department of Meteorology, The Pennsylvania State University, PA. "Circular waves in Bödewadt boundary layers."
20. Sep '95: Transition and Turbulence Seminar Series, Cornell University, NY. "Circular waves in Bödewadt boundary layers".
21. Oct '95: Department of Mechanical and Aeronautical Engineering, Rensselaer Polytechnic Institute, NY. "Circular waves in Bödewadt boundary layers."
22. Apr '96: Department of Aeronautical Engineering and Department of Mathematics, Ohio State University, OH. "Boundary layers and free shear layers in flows between counter-rotating disks."
23. Apr '96: Department of Aerospace and Mechanical Engineering, Princeton University, NJ. "Coupling between endwall boundary layers and rotating flows."
24. Jan '97: Institute for High Performance Computer Applications, The Pennsylvania State University, PA. "Dynamic control of hydrodynamic instabilities."
25. Feb '97: Department of Mechanical and Aerospace Engineering, University of California, Davis, CA. "Boundary layers due to rotating and vortex flows: Computations, experiments, and similarity considerations."
26. Feb '97: Department of Mathematics, University of California, Davis, CA. "Dynamic control of hydrodynamic instabilities."
27. Oct '97: IMA Workshop: Large Scale Dynamical Systems, University of Minnesota, Minneapolis, MN. "Quasiperiodic response to parametric excitation."
28. Oct '97: Department of Applied Physics, Universitat Politècnica de Catalunya, Barcelona, Spain. "Dynamics of flows with viscoelastic interfaces."
29. Oct '97: Department of Mechanical Engineering, University of Málaga, Spain. "Dynamics of flows with viscoelastic interfaces."
30. Dec '97: Department of Mechanical and Aerospace Engineering, University of California, Davis, CA. "Hydrodynamic coupling between a viscoelastic gas/liquid interface and a swirling vortex flow."
31. Jan '98: Air Products and Chemicals Inc., Allentown, PA. "Direct determination of viscoelastic properties of surfactant-influenced gas/liquid interfaces and computations of interfacial flows."

32. Feb '98: Levich Institute for Physico-Chemical Hydrodynamics, CUNY, NY. "Hydrodynamic coupling between a surfactant influenced gas/liquid interface and a swirling vortex flow."
33. Feb '98: Department of Mathematics, Arizona State University, AZ. "Hydrodynamic coupling between a surfactant influenced gas/liquid interface and a swirling vortex flow."
34. Mar '98: Department of Mathematics, Tufts University, MA. "Hydrodynamic coupling between a surfactant influenced gas/liquid interface and a swirling vortex flow."
35. May '98: Department of Aeronautical Engineering, University of Sevilla, Spain. "Quasiperiodic response to parametric excitation."
36. Sep '98: Department of Mathematics and Department of Mechanical Engineering, Arizona State University, AZ. "Periodically forced centrifugally unstable flows."
37. Oct '98: Department of Mathematics, University of Utah, Salt Lake City, UT. "Periodically forced centrifugally unstable flows."
38. Nov '98: Department of Mathematics and SSERC, Arizona State University, AZ. "Peristaltic pumping."
39. Jan '99: Program in Atmospheric and Oceanic Science, University of Colorado, Boulder, CO. "Periodically forced centrifugally unstable flows."
40. Sep '99: Mathematics and Cognition Seminar, Arizona State University, AZ. "On the hydrodynamics of peristaltic pumping."
41. Oct '99: Department of Aerospace Engineering, University of Southern California, LA. "Vortex breakdown: Onset of unsteadiness and multiple states."
42. Nov '99: Department of Physics and Institute for Surface and Interface Sciences, University of California, Irvine, CA. "Aspects of interfacial flows with surfactants."
43. Feb '00: Department of Mechanical and Aerospace Engineering, University of California, Irvine, CA. "Dynamics and bifurcations in a periodically forced Navier-Stokes flow."
44. May '00: Department Mechanical Engineering, Georgia Institute of Technology, GA. "Multiple Unsteady Solutions and Symmetry Breaking in a Confined Swirling Flow."
45. June '01: Mediterranean Institute for Advanced Studies Seminar, Universitat Illes Balears, Palma de Mallorca, Spain "Symmetry breaking, double Hopf bifurcations and mixed modes in flows with $SO(2)$ symmetry."
46. Oct '01: Swiss Federal Institute of Technology, EPFL-Lausane, Switzerland "Symmetry breaking, double Hopf bifurcations and mixed modes in flows with $SO(2)$ symmetry."
47. Oct '01: Laboratory of Thermodynamics in Emerging Technologies, Swiss Federal Institute of Technology, ETH-Zentrum Zurich, Switzerland "Symmetry breaking, double Hopf bifurcations and mixed modes in flows with $SO(2)$ symmetry."
48. Oct '01: Computational and Applied Mathematics Proseminar, Department of Mathematics, Arizona State University, AZ. "Instabilities, Symmetry Breaking and Mode Interactions in an Enclosed Swirling Flow."
49. Mar '02: Department of Mechanical Aerospace and Nuclear Engineering Colloquium, Rensselaer Polytechnical Institute, NY. "Instabilities, Symmetry Breaking and Mode Interactions in Rotating Shear Flows."
50. July '02: Department of Physics and Applied Mathematics, University of Navarra, Pamplona, Spain "Complex dynamics in a short Taylor-Couette annulus."
51. Oct '02: Computational and Applied Mathematics Seminar, Department of Mathematics, Purdue University IN, "Complex dynamics in a short Taylor-Couette annulus."

52. Oct '02: Applied and Computational Mathematics Seminar, Department of Mathematics, Pennsylvania State University, PA, "Complex dynamics in a short Taylor-Couette annulus."
53. Nov '02: Environmental Fluid Dynamics seminar, Arizona State University, AZ, "Complex dynamics in a short Taylor-Couette annulus."
54. Dec '02: Seminario de Mecánica de Fluidos y Matemática Aplicada, ETS Ingenieros Aeronáuticos, Universidad Politecnica de Madrid, Spain, "Complex dynamics in a short Taylor-Couette annulus."
55. Apr '03: Colloquium, Department of Mathematics, University of Southern California, CA, "On 3D instabilities of 2D time-periodic flows."
56. Jul '03: Mediterranean Institute for Advanced Studies Seminar, Universitat Illes Balears, Palma de Mallorca, Spain "On 3D instabilities of 2D time-periodic flows."
57. Nov '03: Laboratory of Thermodynamics in Emerging Technologies, Swiss Federal Institute of Technology, ETH-Zentrum Zürich, Switzerland "Complex dynamics due to competition between instability mechanisms."
58. May '04: Earth and Space Sciences, UCLA, "Spatio-temporal Complexity in a Short Taylor-Couette Flow."
59. Dec '04: CSIRO, Melbourne, "Role of Surfactant Monolayers in Fluid Flow."
60. Apr '05: Seminar, Department of Mechanical Engineering, National University of Singapore "On 3D instabilities of 2D time-periodic flows."
61. Apr '05: Colloquium, Department of Mathematics and Department of Computational Science, National University of Singapore "Symmetry breaking and mode competition in Taylor-Couette flow."
62. Jul '05: Seminar, Department of Applied Physics, Universidad Politecnica de Catalunia, "Symmetry breaking via global bifurcations in Taylor-Couette flow."
63. Sep '05: Seminar, Department of Mechanical Engineering, New Mexico State University, Las Cruces, "On 3D instabilities of 2D time-periodic flows."
64. Apr '06: Institute for Scientific Computing and Applied Mathematics Seminar, Mathematics Department, Indiana University, Bloomington, "Hydrodynamic Spatio-temporal Complexity."
65. Apr '06: Computational and Applied Mathematics Seminar, Department of Mathematics, Purdue University, "On 3D instabilities of 2D time-periodic flows."
66. Oct '06: Mechanical and Aerospace Engineering Seminar, Arizona State University, "Centrifugal Effects in Rotating Convection."
67. Feb '07: Center for Interdisciplinary Research in Fluid Physics Seminar, University of California Santa Barbara, "Quenching of unsteady vortex breakdown."
68. Jul '07: Seminarios de Física No lineal y Teoría del Caos, Universidad Rey Juan Carlos, Madrid Spain, "Quenching of unsteady vortex breakdown."