CURRICULUM VITA

PETER W. BATES

Department of Mathematics
Michigan State University
East Lansing, MI 48824
(517)-353-4875
e-mail: bates@math.msu.edu

- Citizenship: U.S.

PROFESSIONAL EXPERIENCE

- Professor, Michigan State University, January 2002 – present.
- Senior Visitor, University of Auckland, February - May, 2008.
- Senior Visitor, Institute for Mathematics and its Applications, U. Minnesota, September-December, 2007.
- Chair, Department of Mathematics, Michigan State University, January 2002-September 2007.
- Senior Visitor, Research Institute of Mathematical Sciences, Kyoto, May-Aug., 2000.
- Director, Nonlinear Analysis Lab., Brigham Young University, 1996-2000.
- Senior Visitor, The Isaac Newton Institute of Mathematical Sciences, University of Cambridge, U.K., August–December, 1995.
- Chair, Department of Mathematics, Brigham Young University, 1992–1994.
- Full Professor, Brigham Young University, 1988–2004.
- Program Director, Applied Mathematics, National Science Foundation, 1987–1989.

HONORS and AWARDS

- Karl G. Maeser Excellence in Research and Creative Arts Award, Brigham Young University, 1995.
- One Hour Invited Address: "Invariant Manifolds," AMS Regional Meeting, Notre Dame University, April 7-9, 2000.
- One Hour Invited Address: "Invariant Manifolds for Semiflows in Banach Space," SIAM biennial meeting on Dynamical Systems, Snowbird, May, 2001.

PROFESSIONAL SERVICE

- Committee to produce the State of Michigan's High School Mathematics Content Expectations, 2005-2006.
- Editor: Memoirs and Transactions of the American Math. Soc. (2000-2007).
- Editor: Electronic Journal of Differential Equations
- Editor: Journal of Discrete and Continuous Dynamical Systems

- Editor: International Journal of Pure and Applied Mathematics
- Editor: Electronic Journal of Mathematical and Physical Sciences
- Editor: International Journal of Mathematics and Mathematical Sciences
- Editor: Boundary Value Problems
- Editor: Tbilisi Mathematical Journal
- Organizer, Conference on Nonlinear Partial Differential Equations, Provo, UT, March 1987.
- Organizer, NSF-CBMS Conference "Dynamics of Internal Layers and Diffusive Interfaces," Snowbird, UT, May 1987.
- Review: Evaluation of Department of Mathematics, University of Nevada at Las Vegas (at the invitation of the Dean of the College of Science at UNLV), February 1990.
- Editor, special issue of Rocky Mountain Journal of Mathematics, **21**, 1991.
- Program Director, SIAM Dynamical Systems Group, 1990-1993.
- SIAM Conference Committee, 1990-1993.
- Member of the Board of Trustees, Meridian School (K-12), 1992-1995.
- Review: Committee for the Graduate Program at UNLV (with R. Milman, Vice President, U. Cal. San Marcos and G. Mullen, Dean, Penn. State), March 1993.
- Advisory Board, SIAM Dynamical Systems Group, 1996–2000.
- Chair of the Scientific Committee for the US-China Conference on Differential Equations and applications, Hangzhou, PRC, June 1996.
- External Doctoral Committee, Francisco Caicedo, Universidad Nacional de Colombia, December, 1996.
- Co-Editor, US-China Conference on Differential Equations and Applications, International Press, Cambridge, MA, 1997.
- Chair, SIAM subcommittee to award international travel grants to attend ICIAM 99.
- Member, Scientific Committee for the conference on Differential Equations and Computational Simulations, Sichuan, June, 1999.
- Co-Editor, Proceedings of the conference on Differential Equations and Computational Simulations, World Scientific Press, Singapore, 2000.
- Member, Travel Awards Panel, AMS Mathematical Challenges of the 21st Century, Spring 2000.
- Co-Chair Organizing Committee for the SIAM Pacific Rim Conference on Dynamical Systems, Aug. 2000.
- Co-Chair Scientific Committee, International Conference on Differential Equations and Dynamical Systems with Applications, July 3-8, 2001, Lhasa, Tibet, P.R.China
- Chair, VIGRE and PhD Program Review Committee, Texas A&M University, April 28-30, 2002
- Organizer: Special session "Interfaces with anisotropy", Free Bounday Conference, Trento, June, 5-8, 2002.
- Member, Scientific Committee, Satellite Conference of ICM 2002 on Bifurcation and Chaos, Kunming, PRC, August 8-18, 2002

- Member, NSF Site Visit Committee for the Institute of Pure and Applied Mathematics (IPAM), UCLA, November 18-19, 2002.
- Member, NSF Site Visit Committee for the Mathematical Sciences Research Institute (MSRI), UC Berkeley, April 9-11, 2003.
- Member, NSF Site Visit Committee for the Institute for Mathematics and its Applications, Minneapolis, April 28-30, 2003.
- Organizer, Workshop on Defects and their Dynamics, Banff International Research Station, August 10 -16, 2003.
- Co-chair, Scientific Committee, Workshop on Bifurcation Theory and Applications of Dynamical Systems, Jinhua, June 8-12, 2005.
- Member of the Scientific Committee, International Conference on Stochastic and Infinite-Dimensional Dynamical Systems, Chengdu, June 5-10, 2006.
- Chair of Organizing and Scientific Committee, Midwest Conference on Quantitative Biology, Sept 29- Oct 1, 2006.
- Organizer (with K. Lu) Minisymposium at the AMS Regional Meeting, Salt Lake City, Oct 7-8, 2006.
- Organizer (with K. Lu) Minisymposium at the SIAM Conference on Dynamical Systems, Snowbird, May 29, 2007.
- Member of the Scientific Committee for the VII Americas Conference on Differential Equations, Veracruz, Mexico, October 2009.
- Member of several NSF panels including Postdoctoral Fellowships (Chair), UBM, FRG, and disciplinary awards.
- Member, PhD Board for The National Centre for Science and Technology, Tbilisi, Georgia.
- External Reviewer for the Graduate Program in Mathematics at the university of Cincinnati, November - December, 2008.

GRANTS: last ten years

- NSF (Applied Math);PI, Research award $45,000, July 1996–1998.
- ARO; PI, US-China Conference, $15,000, June 1999.
- NSF (Analysis)PI; Research award (Co-PI K. Lu) $54,000 per year, July 1999-Dec 2002.
- NSF (Applied Math);PI, Research award, Discrete and Continuous Nonlocal Evolution Equations and Applications, $82,500, Aug. 1999–July 2004.
- NSF (Analysis)PI, Research award (Co-PI, K. Lu), Theory and Applications for Infinite Dimensional Dynamical Systems, $168,000, July 2002-Aug 2006.
- NSF (Education)Co-PI, Math and Science Partnership (PI, J. Ferrini Mundi, four co-PI's), $35,000,000, September 2003-December 2008.
- NSF (Analysis)Co-PI, Research award (with K. Lu), Topics in Infinite Dimensional Random Dynamical Systems, $270,000 Sept 2004 - Sept 2009.
- NSF (Math/Infrastructure) PI, UBM: Integrated Analysis of Genetic and Cellular Networks, $905,000 Sept 2005 - Sept 2010.
- DARPA, (Group award with PI R. Lenski at MSU, others at several other institutions) Senior Investigator, Microstates to Macrodynamics: A New Mathematics of Biology, MSU budget $2,800,000 approx, Sept 2005 - Sept 2010.

- NSF (Conference)PI, (Co-PI's Gouwei Wei and Leslie Kuhn), Midwest Conference on Quantitative Biology, $20,000 Aug 2006 - July 2007. Also supported through proposals submitted to Inst Math Appl at U MN for $5,000, Inst Math Biol - OSU for $4,000, and MSU-QBMI/UBM for $10,000.
- NSF (Applied Math)Co-PI, Research (PI, Guowei Wei), Mathematical Modeling of Biomolecular Surfaces, $303,310 Aug 2006 - July 2009.
- NSF Co-PI, CCLI award (PI, C. Chiu and Co-PI J. Jackson), Development of a New Calculus and Differential Equations Sequence for Undergraduate Life Sciences Majors, $150,000 May 2008 - April 2011.

PUBLICATIONS, listed by area

Infinite Dimensional Dynamical Systems

(1) (with C. K. R. T. Jones) "Invariant manifold theorems with applications," *Nonlinear Functional Analysis and its Applications* (ed. by S. P. Singh), NATO ASI Series, **173** (1986), 177–186.
(2) (with C. K. R. T. Jones) "Invariant manifold theorems for semilinear partial differential equations," *Dynamics Reported* **2** (1988), 1–38.
(3) (with N. D. Alikakos) "An invariance principle for a class of monotone systems and application to degenerate parabolic systems," *Rocky Mtn. Math. J.* **18** (1988), 215–244.
(4) (with C. K. R. T. Jones) "The stability of standing waves for the nonlinear Klein-Gordon Equation," Proceedings of the Trento Conference on Dynamical Systems, *Advanced Topics in the Theory of Dynamical Systems,* Academic Press (1989), 1–9.
(5) (with S. Zheng) "Inertial Manifolds and Inertial Sets for the Phase Field System," IMA Preprint #806, May 1991.
(6) (with K. Lu) "The Hartman-Grobman Theorem for the Cahn-Hilliard and phase field equations," *J. Dyn. Diff. Eqts.*, **6** (1994), 101–145.
(7) (with K. Lu and C. Zeng) "Normally hyperbolic invariant manifold for semiflow in a Banach space," in US-Chinese Conference on Differential Equations and Applications, P. W. Bates, S-N. Chow, K. Lu, and X. Pan, Eds., International Press, Cambridge, MA, 1997, pp 22-29.
(8) (with K. Lu and C. Zeng) "Existence and persistence of invariant manifolds for semiflows in Banach space," *Memoirs of the AMS*, **135** No. 645 (1998), 130 pages.
(9) (with K. Lu and C. Zeng) "Invariant foliations near normally hyperbolic invariant manifolds for semiflows," *Transactions of the AMS*, **352** (2000), 4641-4676.
(10) (with K. Lu and C. Zeng) "Foliations for semiflows in Banach space near a normally hyperbolic invariant manifold," in US-Chinese Conference on Differential Equations and Applications, P. W. Bates, S-N. Chow, K. Lu, and X. Pan, Eds., International Press, Cambridge, MA, 1997, pp 30-40.

(11) (with K. Lu and C. Zeng) "Invariant foliations of overflowing manifolds for semiflows in Banach Space," *BTNA '98 Proceedings*, Chen, Chow, and Li, Eds., Springer-Verlag, New York, 1999, pp 1–12.
(12) (with K. Lu and C. Zeng) "Persistence of C^k normally hyperbolic invariant manifolds for infinite dimensional dynamical systems," *Proc. First International Congress of Chinese Mathematicians (Beijing, 1998)*, 403–410, AMS/IP Stud. Adv. Math., 20, Amer. Math. Soc., Providence, RI, 2001.
(13) (with K. Lu and C. Zeng) "Persistence of overflowing manifolds for semiflows," *Comm. Pure and Appl. Math.*, **52** (1999), 983–1046.
(14) (with K. Lu and B. Wang) " Attractors for lattice dynamical systems," *Int. J. Bifurcation and Chaos. Appl. Sci. Engrg.* **11** (2001), 143–153.
(15) (with K. Lu and C. Zeng) "Approximate invariant manifolds," in *Diff. Eqts. and Comput. Simulations*, P.W. Bates, S-N. Chow, K. Lu, and D. Xu, Eds., World Sci., Singapore, 2000, pp 26-30.
(16) (with H. Lisei and K. Lu) "Attractors for Stochastic Lattice Dynamical Systems," *J. Stochastics and Dynamics*, **6** (2006), 1–21.
(17) (with C. Zhang) "Traveling Pulses for the Klein-Gordon Equation on a Lattice or Continuum with Long-range Interaction," *J. Discrete Contin. Dynamical Systems* **16** (2006), 235–252.
(18) (with K. Lu and C. Zeng) "Approximately Invariant Manifolds and Global Dynamics of Spike States," *Inventiones Mathematicae*, **174** (2008), 355-433.
(19) (with K. Lu and B. Wang) "Random Attractors for Stochastic Reaction-Diffusion Equations on Unbounded Domains," *J. Differential Equations* **246** (2009) 845-869.

Mathematical Biology

(20) (with I. Aranson, Z. Jia, and D. Karpeev) "Simulation Studies of Self-Organization of Microtubules and Molecular Motors," *Phys. Rev. E.* **77** No 5, (2008), 051905-1 – 051905-8. Also selected for publication in *Virtual Journal of Biological Physics Research* **15** Issue 10 (2008).
(21) (with A. W. Shingleton and Christen Mirth) "Developmental Model of Static Allometry in Holometabolous Insects," to appear, *Proc. Royal Soc. B.*
(22) (with Zhan Chen, Yuhui Sun, G. W. Wei, and Shan Zhao) "Geometric and potential driving formation and evolution of biomolecular surfaces," to appear *Journal of Mathematical Biology.*
(23) "On the stable diversity of quasispecies," in preparation.

Matrix Analysis

(24) (with N. D. Alikakos) "Estimates for the eigenvalues of the Jordan Product of Hermitian matrices," *Lin. Alg. & Appl.* **57** (1984), 41–56.

Nonlinear Analysis

(25) (with I. Ekeland) "A Saddle-Point Theorem," *Differential Equations*, Ahmad, Keener & Lazer, Eds., Academic Press, New York, (1980), 123–126.

(26) "A Variational Approach to Solving Semilinear Equations at Resonance," *Nonlinear Phenomena in Mathematical Sciences*, V. Lakshmikantham, Ed. Academic Press, New York, (1982), 103–112.
(27) "Reduction Theorems for Semilinear Equations at Resonance," *Proc. Amer. Math. Soc.,* **84** (1982), 73–78.
(28) (with A. Castro) "Necessary and sufficient Conditions for Existence of Solutions to Equations with Noninvertible Linear Part," *Revista Colombiana XV* (1981), 7–24.

Numerical Analysis

(29) "Projection Methods for Nonlinear Nodal Problems," Ph.D. Dissertation, The University of Utah, 1976.
(30) (with G. B. Gustafson) "Projection Methods for Nonlinear Nodal Problems," *Rocky Mtn. J. Math.* **7** 3 (1977), 569–608.
(31) (with X. Chen and X. Deng) "A numerical scheme for the two phase Mullins-Sekerka problem," *Electr. J. Differential Equations*, **1995**,11(1995), 1–27.
(32) (with S. Brown) "A numerical scheme for the Mullins-Sekerka evolution in three space dimensions," in *Diff. Eqts. and Comput. Simulations*, P.W. Bates, S-N. Chow, K. Lu, and D. Xu, Eds., World Sci., Singapore, 2000, pp 11–25.
(33) (with Gouwei Wei, and Shan Zhao) "Minimal molecular surfaces and their applications," *J. Comp. Chem.* **29** (2008), 380-391.
(34) P.W. Bates, S. Brown and J. Han; "Numerical analysis for a nonlocal Allen-Cahn equation," to appear *International Journal of Numerical Analysis and Modeling* **6** (2009).

Ordinary Differential Equations

(35) (with G. B. Gustafson) "Green's Function Inequalities for Two-Point Boundary Value Problems," *Pacific J. Math.* **59** 2 (1975), 327–343).
(36) (with G. B. Gustafson) "Maximization of Green's Problems," *SIAM J. Math. Anal.* **7** 6 (1976), 858–871.
(37) (with J. R. Ward) "Periodic Solutions of Higher Order Systems," *Pacific J. Math.* **84** (1979), 275–282.
(38) (with N. D. Alikakos and G. Fusco) "Solutions to the Nonautonomous Bistable Equation with Specified Morse Index," *Trans. American Math. Soc.* **340** (1993), 641–654.
(39) (with X. Ren) "Heteroclinic orbits for a higher order phase transition problem," *European J. Appl. Math.*, **8** (1997), 149–163.
(40) Hartman, Philip Ordinary differential equations. Corrected reprint of the second (1982) edition [Birkhuser, Boston, MA; MR 83e:34002]. With a foreword by Peter Bates. Classics in Applied Mathematics, 38. Society for Industrial and Applied Mathematics (SIAM), Philadelphia, PA, 2002.

Partial Differential Equations

(41) "Hilbert Space Methods for Nonlinear Elliptic Equations," *J. Differential Equations* **32** (1979), 250–257.

(42) (with A. Castro) "Existence and Uniqueness for a Variational Hyperbolic System Without Resonance," *J. of Nonlinear Analysis* **4** (1980), 1151–1156.
(43) "Solutions of Nonlinear Elliptic Systems with Meshed Spectra," *J. Nonlinear Analysis* **4** (1980), 1023–1030.
(44) (with D. L. Barrow) "Bifurcation and Stability of Periodic Traveling Waves for a Reaction-Diffusion System," *J. Differential Equations* **50** (1983), 218–233.
(45) (with D. L. Barrow) "Bifurcation of periodic travelling waves for a reaction-diffusion system," *Ordinary and Partial Differential Equations,* W. N. Everitt and B. D. Sleeman, Eds., *Lecture Notes in Math.* **964** Springer-Verlag, New York (1982), 69–76.
(46) (with D. L. Barrow) "Bifurcation from collinear solutions to a reaction-diffusion system," *Nonlinear Partial Differential Equations* J. Smoller, Ed., Contemporary Mathematics **17**, American Math. Soc ., (1983), 179–188.
(47) (with K. J. Brown) "Convergence to equilibrium in a reaction-diffusion system," *Nonlinear Analysis* **8** (1984), 227–235.
(48) "Containment for Weakly Coupled Parabolic Systems," *Houston J. Math.* **11** (1985), 151–158.
(49) "Travelling waves in radially symmetric reaction-diffusion systems," *Proc. Roy. Soc. Edin.* **99A** (1985), 269–275.
(50) "Existence and containment of solutions to parabolic systems," in Nonlinear Functional Analysis and its Applications, F. Browder, Ed., *Proc. Symp. Pure Math.* **45**, A.M.S., 1986, 103–108.
(51) "Containment of solutions to strongly coupled parabolic systems," *Trends in the Theory and Practice of Nonlinear Analysis* North Holland Amsterdam (1985), 45–54.
(52) "Invariant manifolds for perturbations of nonlinear parabolic systems with symmetry," Amer. Math. Soc., *Lectures in Applied Math.* **23** (1986), 209–217.
(53) (with N. D. Alikakos) "Stabilization of solutions for a class of degenerate equation in divergence form in one space dimension," *J. Diff. Eqts* **73** (1988), 363–393.
(54) (with N. D. Alikakos and C. P. Grant) "Blow up for a diffusion-advection equation," *Proc. Royal Soc. Edin.* **113A** (1989), 181–190.
(55) (with S. Zheng) "Inertial Manifolds and Inertial Sets for the Phase-Field System," *J. Dyn. Diff. Eqts.* **4** (1992), 375–397.
(56) (with X. Ren) "Transition layer solutions of a higher order equation in an infinite tube," *Comm. PDE's*, **21** (1996), 195–220.
(57) (with P. Fife, R. Gardner and C. Jones) "The existence of travelling wave solutions of a generalized phase-field model," *SIAM J. Math. Analysis*, **28**, (1997), 60–93.
(58) (with N. Alikakos and X. Chen) "Periodic traveling waves and locating oscillating patterns in multidimensional domains," *Transactions of the American Math. Soc.*, **351**, (1999), 2777–2805.
(59) (with F. Chen and J. Wang) "Global existence and uniqueness of solutions to a nonlocal phase-field system," in US-Chinese Conference on Differential Equations and Applications, P. W. Bates, S-N. Chow, K. Lu, and X. Pan, Eds., International Press, Cambridge, MA, 1997, pp 14-21.

(60) (with F. Chen, and P. Wang) "Existence of global solution for a differential system with initial data in L^p," *Internat. J. Math. and Math. Sci.*, **22** (1999), 823–834.
(61) (with F. Chen) "Periodic traveling waves for a nonlocal integro-differential model," *Electronic J. Diff. Eqs.* **1999** No. 26 (1999), 1–19.
(62) (with F. Chen) "Spectral analysis of traveling waves for nonlocal evolution equations," *SIAM J. Math. Analysis*, Vol 38, (2006), 116–126.
(63) (with G. Zhao) "Existence, Uniqueness and Stability of the Stationary Solution to a Nonlocal Evolution Equation Arising in Population Dispersal," *J. Math. Anal. Appl.*, **332** (2007) 428440.

Phase Transitions

(64) (with P. C. Fife) "A comparison principle for spectra of the Cahn-Hilliard equation, and time scales for the coarsening process," *Physica D.* **43** (1990), 335–348.
(65) "Interface dynamics for the Cahn-Hilliard equation," in *Analysis of Nonlinear Phenomena and its Applications*, T. Nishida, Ed., Research Institute for Math. Sci., Kyoto (1992), 1–3.
(66) "Coarsening and nucleation in the Cahn-Hilliard equation," in *Free boundary problems involving solids*, J. M. Chadam and H. Rasmussen, Eds., Pitman Research Notes in Math. **281** Longman Sci. & Tech., Harlow, (1993), 220-225.
(67) (with P. C. Fife) "Nucleation Dynamics in the Cahn-Hilliard Equation," *SIAM J. Appl. Math.* **53** (1993), 990–1008.
(68) (with P. Fife, X. Ren and X. Wang) "Traveling waves in a convolution model for phase transitions," *Archive for Rational Mechanics and Analysis*, **138**, (1997), 105-136.
(69) (with P. Fife, R. Gardner and C. Jones) "Phase field models for hypercoded solifidication," *Physica D*, **104** (1997), 1-31.
(70) "The Mathematics of Phase Transitions," Postgraduate Lecture Notes in Mathematics, Universidad Nacional de Colombia, October, 1998, 47 pages.
(71) (with G. Fusco) "Multi-spike states of the Cahn-Hilliard model for phase transitions," *Lecture Notes of the Japan Math. Soc. School on Concentration Phenomena*, to appear.
(72) (with A. Chmaj) "An integrodifferential model for phase transitions: Stationary solutions in higher space dimensions," *J. Statistical Physics*, **95** (1999), 1119–1139.
(73) (with A. Chmaj) "On a discrete convolution model for phase transitions," *Arch. Rat. Mech. Anal.*, **150** (1999), 281–305.
(74) (with F. Chen) "Traveling waves for a nonlocal phase-field system," *Interfaces Free Boundaries* **4** (2002), no. 3, 227–238.
(75) (with X. Chen and A. Chmaj) "Equilibria and traveling waves for bistable equations with non-local and discrete dissipation," *Nonlinear Diffusive Systems–Dynamics and Asymptotics,* E. Yanagida and Y. Morita, Eds., pp 48-71, RIMS Kokyuroku **1178**, Kyoto University Press, 2000.
(76) (with F. Chen) "Spectral analysis and multidimensional stability of traveling waves for nonlocal Allen-Cahn equation," *J. Math. Anal. Appl.* **273** (2002), no. 1, 45–57.

(77) (with X. Chen and A. Chmaj) "Traveling Waves of Bistable Dynamics on a Lattice," *Soc. Indust. Appl. Math. J. on Math. Analysis*, **35** (2003), 520 – 546.
(78) (with J. Han) "The Neumann boundary problem for a nonlocal Cahn-Hilliard equation," *J. Diff. Eq.*, **212** (2005), no. 2, 235–277.
(79) (with J. Han) "The Dirichlet boundary problem for a nonlocal Cahn-Hilliard equation," *J. Math. Anal. Appl.*, **311** (2005), no. 1, 289–312.
(80) (with J. Han and G. Zhao) "On a Nonlocal Phase-Field System," *J. Nonlin. Analysis*, **64** (2006), no. 10, 2251–2278.
(81) (with X. Chen and A. Chmaj) "Heteroclinic solutions of a Van der Waals model with indefinite nonlocal interactions," *J. Calculus of Variations, PDEs*, **24** (2005), 261-281.
(82) "On some nonlocal evolution equations arising in materials science," Fields Institute Communications, **48**, Nonlinear Dynamics and Evolution Equations Edited by: Hermann Brunner and Xiao-Qiang Zhao, The American Mathematical Society, Providence, RI, 2006, pp 13-52.
(83) (with N. D. Alikakos, J. W. Cahn, P.C. Fife, G. Fusco, and G.B. Tanoglu) "Analysis of a corner layer problem in anisotropic interfaces," *Discrete Cont. Dyn. Syst. B*, **6** (2006), 237–255.

Singular Perturbations

(84) (with N. D. Alikakos) "On the singular limit in a phase field model of phase transition," *Ann. Inst. Henri Poincaré* **5** (1988), 141–178.
(85) (with N. D. Alikakos and G. Fusco) "Slow motion manifolds for the Cahn-Hilliard equation in one space dimension," *J. Differential Equations* **90** (1991), 81–135.
(86) (with N. D. Alikakos and G. Fusco) "Slow motion manifolds for a class of singular perturbation problems: the linearized equations," in *Differential Equations and Mathematical Physics*, C. Bennewitz, Eds., Math. in Sci. and Eng. **186** Academic Press, Boston, (1992), 1–24.
(87) (with J-P Xun) "Metastable Patterns for the Cahn-Hilliard Equation: Part I," *J. Differential Equations*, 111 (1994), 421–457.
(88) (with N. D. Alikakos and X. Chen) "Convergence of Cahn-Hilliard to Hele-Shaw Dynamics," *Arch. Rat. Mech. Analysis*, **128** (1994), 165–205.
(89) (with N. Alikakos and X. Chen) "Asymptotics of the Cahn-Hillard flow," in "Curvature Flows and Related Topics," A. Damlanian, J. Spruck, A. Vis intin, Eds., p13–24, Gatuko International Series, Gakkotosho, Tokyo, Japan, 1995.
(90) (with J-P Xun) "Metastable patterns for the Cahn-Hilliard Equation: Part II, Layer dynamics and slow invariant manifold," *J. Differential Equations* **116** (1995), 165–216.
(91) (with G. Fusco) "Equilibria with many nuclei for the Cahn-Hilliard equation," *J. Diff. Eqs.*, **160** (2000), 283-356.
(92) "Convergence of level sets for solutions to the Cahn-Hilliard equation to the Mullins-Sekerka flow," MSRI Lecture Notes and Streaming Video, (1999) http://msri.org/publications/ln/msri/1999/materials/pwbates/1/title.html

(93) (with E. N. Dancer and J. Shi) "Multi-spike stationary solutions of the Cahn-Hilliard equation in higher dimension and instability," *Advances in Diff. Eqts.*, **4** (1999), 1-69.
(94) (with N. Alikakos, X. Chen, and G. Fusco) "Mullins-Sekerka motion of small droplets on a fixed boundary," *J. Geom. Anal.*, **10** (2000), 575-596.
(95) (with J. Shi) "Existence and Instability of Spike Layer Solutions to Singular Perturbation Problems," *J. Functional Analysis*, **196** (2002), no. 2, 211-264.
(96) (with X. Pan) "Nucleation of instability of the Meissner state of 3-dimensional superconductors," *Comm. Math. Phys.* **276** (2007), no. 3, 571–610.

ADDRESSES, last several years

- Colloquium: Imperial College, University of London, "Traveling waves for higher order or nonlocal models for phase transition," June 26, 1995.
- Invited talk: Inst. for Advanced Study–Park City Math. Inst. on Nonlinear Waves, "Persistence of normally hyperbolic invariant manifolds for semiflows in Banach space," July 14, 1995.
- Invited talk: Internat. Conf. on Generalized Stefan Problems, Pavia, "Theoretical and numerical results for a Hele-Shaw type model of phase transition", Aug. 31, 1995.
- Invited talk: Euroconference on Finite and Infinite Dimensional Dynamical Systems, Cambridge, U.K., "Persistence of normally hyperbolic invariant manifolds for semiflows in Banach space," September 6, 1995.
- Invited talk: Workshop on Inertial Manifolds, Isaac Newton Institute, "A Hartman-Grobman theorem for semiflows in Banach space," October 13, 1995.
- Colloquium: University of Rome, "Travelling waves for nonlocal and higer order Allen-Cahn equations," October 17, 1995.
- Invited talk: Workshop on pattern dynamics, Isaac Newton Institute, "Interfacial dynamics for generalized phase field systems," October 23, 1995.
- Colloquium: University of Sussex, "Travelling waves for nonlocal and higher order parabolic PDEs," October 31, 1995.
- Colloquium: University of Strathclyde, "Travelling waves for nonlocal and higher order phase field equations," November 8, 1995.
- Colloquium: University of Southampton, "Higher order phase-field equations with anisotropy," December 4, 1995.
- Colloquium: Worcester Polytechnic Institute, "The dynamics of phase transitions", January 30, 1996.
- PDE Seminar: Brown University, "Travelling waves for nonlocal and higher order phase field equations," February 2, 1996.
- Lecture Series (3 one hour talks): Brown University, " Persistence of invariant manifolds," February 4-14, 1996.
- Colloquium: Univ. Tennessee, "The dynamics of phase transitions", Feb. 21, 1996.
- PDE Seminar: Univ. of Tennessee, " Persistence of invariant manifolds," Feb. 22, 1996.
- NAL Seminar: BYU, "Phase transition models with anisotropy", March 7, 1996.

- Invited talk: Southwest Conference on Dynamical Systems, " Persistence of invariant manifolds for semiflows in Banach space," University of Arizona, March 24, 1996.
- Colloquium: "Persistence of normally hyperbolic invariant manifolds," University of Rome, April, 1996.
- Colloquium: "Nonlocal and higher order models for phase transitions," Ryokoku University, May 25, 1996.
- Colloquium: "Nonlocal and higher order models for phase transitions," University of Hiroshima, May 30, 1996.
- Plenary Talk: "The dynamics of phase transitions," US-China Conference on Recent Developments in Differential Eqts. and Appls., Hangzhou, June 24, 1996.
- Colloquium: "The gradient theory of phase transitions," Central China Normal University, Wuhan, July 4, 1996.
- Colloquium: "Traveling waves in nonlocal and higher order models of phase transition," Academia Sinica, Beijing, July 6, 1996.
- Clifford Lecture: "Oscillating patterns and periodic traveling waves," Tulane University October 30, 1996.
- Colloquium: "The mathematics of phase transitions," University of Nevada at Las Vegas, October 10, 1996.
- Colloquium: "The gradient theory of phase transitions," National University of Colombia, Bogota, December 17, 1996.
- Colloquium: "The gradient theory of phase transitions," Universidad Nacional de Colombia sede Medellin, December 19, 1996.
- Seminars: "Multispike solutions of the Cahn-Hilliard Equation," BYU, January 1997.
- Colloquium: "Dynamics in nonlocal and higher order models of phase transition," University of Chicago, February 4, 1997.
- Invited talk: "Nonlocal and higher order models for phase transitions," SIAM Conference on Material Science, Philadelphia, May 13, 1997.
- Colloquium: "The gradient theory of phase transitions," University of Athens, Greece, June 5, 1997.
- Invited Talk: "Invariant manifolds and foliations for semiflows in Banach space," AMS Conference, Atlanta, October 18, 1997.
- Invited Talk: "Multipeaked solutions to the Cahn-Hilliard equation," AMS Conference, Milwaukee, October 24, 1997.
- Invited Talk: "Encounters with Mathematics," Meridian School, November 5, 1997.
- Invited Talk: "Multipeaked solutions to the Cahn-Hilliard equation," Mexican Math. Soc. Conference, Oaxaca, December 8, 1997.
- Invited Talk: "Multipeaked solutions to the Cahn-Hilliard equation," Canadian Math. Soc. Annual Meeting, December 16, 1997.
- Seminar: "Multi-peaked solutions to the Cahn-Hilliard equation," Courant Institute, NYU, April 2, 1998.
- Colloquium: "Invariant manifolds for semiflows in Banach space," IIMAS, UNAM, Mexico City, May 6, 1998.

- Colloquium: "The Mathematics of Phase Transitions," IIMAS, UNAM, Mexico City, May 7, 1998.
- Colloquium: "Spinodal Decomposition, Nucleation, and Slow Motion for the Cahn-Hilliard Equation," The Chinese University of Hong Kong, June 9, 1998.
- Plenary Talk: "Pinning of Interfaces for the Nonlocal Allen-Cahn Equation in Higher Space Dimensions," Conference on Phase Transitions and Free Boundary Problems, Hangzhou, PRC, June 17, 1998.
- Plenary Talk: "Equilibria and dynamics associated with a nonlocal model of phase transitions," International Conference of Lattice Dynamical System, National Chiao Tung University, Taiwan, June 26, 1998.
- Colloquium: "Spinodal Decomposition, Nucleation, and Slow Motion for the Cahn-Hilliard Equation," The Central University of Caracas, July 8, 1998.
- Seminar: "A numerical scheme for the Hele-Shaw flow," The Central University of Caracas, July 9, 1998.
- Invited Talk: "Robust Oscillating Patterns for a Periodic Bistable Equation," Taller sobre Problemas Fisicos y Matematicos de la Dinamica de Fluidos," Universidad de Los Andes, Merida, Venezuela, July 15, 1998.
- Lecture Series: "The Mathematics of Phase Transition," five hours of lectures at the Taller de Ecuaciones Differenciales y Aplicaciones, National University of Colombia, Medellin, July 21-24, 1998.
- Lecture Series: "Multi-spike solutions to the Cahn-Hilliard Equation," eight hours at the Mathematics Society of Japan Workshop on Concentration Phenomena, Sendai, August 3-11, 1998.
- Colloquium: "Traveling waves in a lattice dynamical system with long-range interaction," University of Hokkaido, August 12, 1998.
- Plenary Talk: "Multi-spike solutions to the Cahn-Hilliard Equation," Third Americas Conference on Differential Equations, Atlanta, September 8-12, 1998.
- Invited Talk: "Pinning of interfaces for the nonlocal Allen-Cahn equation in higher space dimensions," Phase Field Models and Surface Effects, Cortona, Sept. 14-18, 1998.
- Invited Talk: "Multi-peaked solutions to the Cahn-Hilliard equation," Conference in honor of Alan Lazer's 60th birthday, Miami, Jan 8-9, 1999.
- Colloquium: "Traveling waves for higher order and nonlocal equations of phase transition," Utah State University, Jan 28, 1999.
- Invited Talk: "Convergence of level sets for solutions to the Cahn-Hilliard equation to the Mullins-Sekerka flow," Self-Assembling Geometric Structures in Material Science: The Geometry of Interfaces in Mesoscopic Materials, MSRI, April 12-14, 1999.
- Invited Talk:"A discrete convolution model for phase transitions," SIAM Dynamical Systems Conference, Snowbird, May 24, 1999.
- Invited Talk:"Multi-spike solutions to the Cahn-Hilliard Equation," SIAM Dynamical Systems Conference, Snowbird, May 26, 1999.
- Plenary Talk: "The motion of phase interfaces in binary alloys," Internat. Conf. on Differential Equations and Computational Simulations, Chengdu, China, June 13-18, 1999.

- Plenary Talks:"Nonlocal and discrete models for phase transition: Propagation and pinning of interfaces," Euroconference: Dynamics of Patterns, Anogia, Crete, June 22 and June 24, 1999.
- Colloquium "Interfaces for the Nonlocal Allen-Cahn Equation in Higher Space Dimensions," Georgia Tech., Sept. 27, 1999.
- Plenary Talk: "Interfaces for the Nonlocal Allen-Cahn Equation in Higher Space Dimensions," Free Boundary Problems '99, Chiba, Japan, Nov 8-13, 1999.
- Plenary Talk: "Interfaces for the Nonlocal Allen-Cahn Equation in Higher Space Dimensions," IMS conf. Reaction-Diffusion Systems, Hong Kong, Dec. 5-10, 1999.
- Invited Talk: "Periodic Traveling Waves for a Nonlocal Reaction-Diffusion Equation," Special Session of the Annual Meeting of the AMS, Jan. 19-22, 2000.
- Colloquium: "Interfaces for the Nonlocal Allen-Cahn Equation in Higher Space Dimensions," University of Colorado, Feb. 25, 2000.
- Colloquium: "Interfaces for the Nonlocal Allen-Cahn Equation in Higher Space Dimensions," North Carolina State University, Mar. 1, 2000.
- Colloquium: "Invariant manifolds for semiflows in Banach space" University of North Carolina, Mar. 2, 2000.
- One Hour Invited Address: "Invariant Manifolds," AMS Regional Meeting, Notre Dame University, April 7-9, 2000.
- Invited Talks: "Discrete and Nonlocal Dispersive Equations, I and II," Nonlinear Diffusive Systems – Dynamics and Asymptotics, RIMS, Kyoto, May 30-June 2, 2000.
- Colloquium: "Multi-Spike Solutions to the Cahn-Hilliard Equation," University of Hiroshima, June 19, 2000.
- Invited Talk: "Oscillating Patterns and Periodic Traveling Waves for a Bistable Reaction-Diffusion Equation," Workshop on Evolution Equations, University of Hokkaido, Sapporo, June 28-29, 2000.
- Colloquium: "Invariant Manifolds and Foliations," Tohuko University, Sendai, July 24, 2000.
- Colloquium: "Periodic Traveling Waves," University of Tokyo, July 27, 2000.
- Invited talk: "Waves in a bistable lattice with strong interaction which is mildly indefinite" Lorentz Center (U. Leiden) Workshop on "Front propagation in discrete and periodic media", October 4-6, 2000.
- Seminar: "Traveling Waves in a Bistable Lattice System", Boston U., October 23, 2000.
- Invited talk: "Traveling Waves in a Bistable Lattice System", "Evolution equations 2000", Levico, Oct 30-Nov 4, 2000.
- Invited talk: "Traveling waves in lattice systems", SW Regional Dynamics Workshop, USC, November 19, 2000.
- Colloquium: "The Mathematics of Phase Transition", Lehigh University, December 13, 2000.
- Colloquium: "The Mathematics of Phase Transition", Michigan State University, March, 2001.

- Invited talk: AMS Conference, "Stability of multidimensional traveling waves for a nonlocal Allen-Cahn equation," UNLV, April, 2001.
- Plenary talk: " Invariant manifolds for semiflows in Banach space," Fifth Mississippi State Conference on Differential Equations and Computational Simulations, May 18-19, 2001
- Plenary talk: " Invariant manifolds for semiflows in Banach space," Sixth SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, May 20-24, 2001.
- Invited talk: "Traveling waves in lattice systems," Workshop on phase transitions," University of Athens, May, 2001.
- Invited talk: "Existence and Morse Index of Multi-Spike Solutions to Singularly Perturbed Elliptic Equations," Isaac Newton Institute, Cambridge, UK, June 2001.
- Plenary talk: " Invariant manifolds for semiflows in Banach space," Lhasa, Tibet, June 2001.
- Invited talk: "Traveling waves in lattice systems," Workshop on Generalized Traveling Waves, Kobe, Japan, October, 2001.
- Invited talk: "Spike Solutions to Singularly Perturbed Elliptic Equations and their Morse Indices," Kyoto, November, 2001.
- Invited talk: "Multispike solutions to nonlinear elliptic equations," University of Michigan, April 10, 2002
- Invited talk: "Waves for Bistable Equations with Non-Local Mexican Hat Interaction," Boston University, April 16, 2002
- Invited talk: "Spike Solutions and Morse Indices," Fourth International Conference on Dynamical Systems and Differential Equations, Wilmington NC, May 24-27, 2002.
- Invited talk: "Waves for Bistable Equations with Non-Local Mexican Hat Interaction," Fourth International Conference on Dynamical Systems and Differential Equations, Wilmington NC, May 24-27, 2002.
- Invited talk: "Waves for Bistable Equations with Non-Local Mexican Hat Interaction," Univ. Rome III, June 10, 2002.
- Invited talk: "Multispike solutions to nonlinear elliptic equations," joint meeting of AMS and UMI, Pisa, June 12 - 16, 2002.
- Invited talk: "Spike layer solutions and Lyapunov-Schmidt reduction," 5th Americas conference on differential equations and nonlinear dynamics, Edmonton, July 7-12, 2002.
- Invited talk: "Multispike solutions to nonlinear elliptic equations," XIII ELAM, Cartagena, July 30-Aug 3, 2002.
- Plenary talk: " Traveling waves for a bistable equation with nonlocal and indefinite interaction," Satellite Conference of ICM 2002 on Bifurcation and Chaos, Kunming, PRC, August, 2002
- Colloquium: "A new class of evolution equations suggested by phase transition in materials," University of Virginia, September 26, 2002.
- Colloquium: "A new class of evolution equations suggested by phase transition in materials," College of William and Mary, September 27, 2002.

- Colloquium: "A new class of evolution equations suggested by phase transition in materials," Calvin College, October 24, 2002.
- Invited talk "Traveling waves in bistable media with nonlocal indefinite interaction", Invasion Phenomena in Biology and Ecology, Institute Henri Poincare, Paris, November 4-8, 2002.
- Colloquium: "Patterns and waves in mathematical material science," BYU, December, 2002.
- Invited talk "Mathematics of material science," Graduate Seminar, BYU, March 3, 2003.
- Invited talk "Patterns and waves for discrete and continuum bistable equations with indefinite interaction," Mathematical Biology Institute, Columbus, OH, March 6-8, 2003.
- Invited talk "Patterns and waves for discrete and continuum bistable equation with nonlocal and indefinite interaction," University of Michigan, April 11, 2003.
- Invited talk "Traveling waves for a bistable equation with nonlocal and indefinite interaction," SIAM conference on Dynamical Systems, Snowbird, UT, May 26-31, 2003.
- Lecture Series: "Nonlocal evolution equations" – Six hours, U. Cartagena, July, 2003.
- Invited talk: "Patterns and waves for discrete and continuum bistable equation with indefinite interaction," BIRS, August 11, 2003.
- Invited talk: "Patterns and waves for nonlocal bistable equation with indefinite interaction," Indiana University, September 29, 2003.
- Plenary talk: "Patterns and waves for nonlocal bistable equation with indefinite interaction," Workshop on Dynamical System and Its application to Biology, National Center for Theoretical Sciences, Taiwan, November 24 - 28, 2003.
- Plenary talk: "Patterns and waves for nonlocal bistable equation with indefinite interaction," International Conference on New Directions in Dynamics and Evolution Equations, Changsha, PRC, Dec 17-20, 2003.
- Invited talk: "Evaluating Teacher Education Programs," TEEM-UP for K-12, American Society for Mechanical Engineers, Clearwater, FL, March 4-5, 2004.
- Participant: Workshop Assessing Students' Mathematics Learning: Issues, Costs and Benefits, MSRI, Berkeley, CA, March 7- 10, 2004
- Invited talk: "Heteroclinic solutions to a nonlocal bistable equation with indefinite interaction," New developments on variational methods and their applications, Banff International Research Station, Canada, May 15 - 20, 2004
- Plenary talk: "Attractors for Stochastic Lattice Dynamical Systems," Nonlinear Dynamics and Stochastic Partial Differential Equations, Academia Sinica, Beijing, China during May 27–31, 2004.
- Plenary talk: "Nonlocal Evolution Equations," 2004 Free Boundary Problems Conference, Montecatini, 10-12 June 2004.
- Plenary talk: "Nonlocal Evolution Equations," AIMS' Fifth International Conference on Dynamical Systems and Differential Equations, Pomona, CA, June 16 - 19, 2004.

- Invited talk: "The Nonlocal Cahn-Hilliard Equation," special session Mathematical Models and Methods in Phase Transitions, AIMS' Fifth International Conference on Dynamical Systems and Differential Equations, Pomona, CA, June 16 - 19, 2004.
- Plenary talk: "Attractors for Stochastic Lattice Dynamical Systems," NCTS International Conference on Dynamical Systems, National Tsing Hua University, Taiwan, June 23-28, 2004.
- Plenary talk: "Nonlocal Evolution Equations," International Conference on Nonlinear Dynamics and Evolution Equations, Memorial University of Newfoundland, July 6-10, 2004.
- Professional Presentations: "Analysis of attempted solutions to a word problem typical of students at varying grade levels" and "A student's discovery of a novel method to determine the formula for the area of a circle" PROM/SE Summer Institutes, Cincinnati, Aug. 10, Cleveland, Aug. 11, and East Lansing, Aug. 12, 2004.
- Plenary talk: "Nonlocal Evolution Equations: Basic Theory and Waves," INdAM workshop on Dissipative Models in Phase Transitions, Cortona (Italy), September 5-11, 2004.
- Undergraduate Colloquium: "Mathematics and Material Science," Albion College, MI, Sept. 23, 2004.
- Participant: Modeling of Soft Matter, IMA, Minneapolis, Sept 27-October 1, 2004.
- Interdisciplinary Seminar: "Mathematics and Material Science," Institute for Electronic and Information Science, Hokkaido University, October 14, 2004.
- Colloquium "Nonlocal Evolution Equations," University of Kansas, November 12, 2004.
- Invited talk: "Nonlocal Evolution Equations," Pan American Advanced Studies Institute, Santiago, Chile, Jan 17, 2005.
- Seminar talk: Working Group on Rimming in Fuel for High Burnup Light Water Reactors, Sapporo, Mar 2-12, 2005.
- Colloquium: "Nonlocal Evolution Equations," Arizona State University, March 21, 2005.
- Colloquium: "Nonlocal Evolution Equations," Boston University, April 19, 2005.
- Colloquium: "Nonlocal Evolution Equations," University of Pittsburgh, April 22, 2005.
- Invited talk: "Fronts and Pulses in Media with Nonlocal Interaction," Special Session, SIAM, Snowbird, May 25, 2005.
- Invited talk: "Attractors for Lattice Random Dynamical Systems," Special Session, SIAM, Snowbird, May 26, 2005.
- Invited talk: "Patterns and Waves for Nonlocal Equations," Workshop on Bifurcation Theory and Applications of Dynamical Systems, Jinhua, June 12, 2005.
- Invited talk: "Patterns and Waves for Nonlocal Equations," ECNU Workshop on Nonlinear Partial Differential Equations, Shanghai, June 15, 2005.

- Invited talk: "Patterns and Waves for Nonlocal Equations," Sichuan University Summer School in Stochastic Equations and PDEs, Chengdu, June 17, 2005.
- Invited talk: "Analysis of a Corner Layer in Anisotropic Interfaces," International Conference on Dynamical Systems, Huangshan, June 20, 2005.
- Invited talk: " Traveling Kinks and Pulses for Nonlocal Evolution Equations," Workshop on Infinite-Dimensional Dynamical Systems, CIRM, Luminy, France, July 6, 2005.
- Plenary talk: " Traveling Kinks and Pulses for Nonlocal Evolution Equations," Workshop on Dynamical Problems in Mathematical Materials Science, CSIM, Edinburgh, July 21, 2005.
- Invited Talk: "Mathematical Ideas and Biological Sciences," DARPA workshop on Fundamental Problems in Biology, Princeton September 22, 2005.
- Colloquium: "Nonlocal evolution equations arising in materials science," Illinois Institute of Technology, December 5, 2005.
- Colloquium: "Nonlocal evolution equations arising in the biological and physical sciences," U. Cal. Irvine, April 14, 2006.
- 90 min talk: "Attractors for Lattice Random Dynamical Systems," Advanced graduate summer school, Chengdu, June 5, 2006.
- Plenary talk "Nonlocal evolution equations arising in the biological and physical sciences," International Conference on Stochastic and Infinite-Dimensional Dynamical Systems, Chengdu, June 5-10, 2006.
- Invited Talk: "Attractors for Lattice Random Dynamical Systems," Workshop on Nonlinear PDE's, East China Normal University, Shanghai, June 10-11, 2006.
- Invited Talk: "Invariant Manifolds of Spikes," Recent Advances in Nonlinear Partial Differential Equations, Armidale, Australia, July 16-21, 2006.
- Invited Talk: "Invariant Manifolds of Spikes," AMS Regional Meeting, Salt Lake City, Oct 7-8, 2006.
- Plenary talk: "Invariant Manifolds of Spikes," 26th Annual SEARCDE conference, North Carolina, October 27-28, 2006.
- Undergraduate Colloquium: "Nonlocal evolution equations arising in the biological and physical sciences," Virginia Union University, March 20, 2007.
- Invited Talk: "The onset of instability of the Meissner state for 3-D superconductors," International Conference on Superconductors and Liquid Crystals, East China Normal University, May 2007.
- Invited Talk: "Invariant Manifolds of Spikes," SIAM Conference on Dynamical Systems, Snowbird, May 29, 2007.
- Plenary Talk: "Invariant Manifolds of Spike-like Solutions to Nonlinear Parabolic Equations," Americas Conference on Differential Equations, Catagena, Colombia, July 26, 2007.
- Applied Math Seminar: "Patterns and waves in media with nonlocal interaction," University of Minnesota, September, 2007.
- Invited Talk: "Invariant Manifolds of Spikes," Recent Developments in Nonlinear Elliptic and Parabolic Equations, BIRS, October 8-13, 2007.
- Math Club Seminar: "Mathematics and materials science," U. Minnesota, October 2007.

- PDE seminar: "The onset of instability of the Meissner state for 3-D superconductors," University of Minnesota, October 17, 2007.
- Invited Talk: "Pattern formation with microtubules mediated with molecular motors," Midwest workshop on quantitative biology, October, 2007.
- Invited Talk: "Invariant Manifolds of Spike-like Solutions to Nonlinear Parabolic Equations," Conference in Honor of Avner Friedman's 75th Birthday, Mathematical Biology Institute, Ohio State University, November 15-18, 2007.
- Invited Talk: "Invariant Manifolds of Spikes," CBMS Regional Conference, San Antonio Texas, December 2007.
- Invited Talk: "Pattern formation with microtubules mediated with molecular motors," DARPA meeting on Fundamental Problems in Biology, San Francisco, January 8-11, 2008.
- Undergraduate Colloquium: "Complexity in Biological Processes: Playground for Mathematicians," Brigham Young University, January 15, 2008.
- Plenary Talk: "Invariant Manifolds of Spikes," ICMC-Summer Meeting on Differential Equations in honor of Jack Hale's 80th Birthday, Sao Carlos, Brazil, January 28- February 1, 2008.
- Applied Math Seminar: "Vortex and aster patterns mediated through molecular motors in families of microtubules," University of Auckland, February 28, 2008.
- PDE seminar: "The onset of instability of the Meissner state for 3-D superconductors," University of Sydney, May 2008.
- Invited talk: "The onset of instability of the Meissner state for 3-D superconductors," Conference on Analysis and PDEs, University of Athens, Greece, May 14-17, 2008.
- Colloquium: "Invariant Manifolds of Spikes," University of Crete, May 21, 2008.
- PDE seminar: "Invariant Manifolds of Spikes," PDE seminar, University of Athens, June 7, 2008.
- PDE seminar: "The onset of instability of the Meissner state for 3-D superconductors," University of Rome II, June 10, 2008.
- PDE seminar: "Invariant Manifolds of Spikes," University of L'Aquila, June 11, 2008.
- Invited talk: "Vortex and aster patterns mediated through molecular motors in families of microtubules," CIRM workshop on Mathematical Biology, Luminy, June 16, 2008.
- Presentation: "Invariant Manifolds of Spikes," Conference on Elasticity and PDEs in honor of John Ball's 60th birthday, Edinburgh, Scotland, June 23 - 27, 2008.
- Lecture Series: Three one hour lectures on "PDE Methods for Materials Science," The National University of Colombia, Bogota, August 4-7, 2008.
- Invited talk: "Invariant Manifolds of Spike-Like Solutions to Nonlinear Parabolic Equations," International Conference on Infinite-Dimensional Dynamical Systems, Fields Institute, Sept. 24-28, 2008.
- Plenary talk: "Mathematical Excursions Inspired by Materials Science," Harvey Mudd Conference on Nonlinear Analysis, Claremont, CA, October 25, 2008.
- Colloquium: "Mathematical Problems Arising in Materials Science," University of Alabama, November 21, 2008.

UNDERGRADUATE PROJECTS OR HONORS THESES SUPERVISED

- Nathan Kleinman, Patrick Schone, Melissa Kemmerle, Michael Higley.

M.S. AND PH.D. STUDENTS

- M.S.: Chris Grant, Patrick Schone, David Smith, Jie Liu, Ximing Zhou, Cindy Deng, Sarah Brown, Gina Thompson.
- Ph.D.:
  P. J. Xun (1994)- Intel,
  Chongchun Zeng (1997)- NYU(3yr postdoc), U. VA (tenured), GaTech (tenured); Sloan and CAREER awards,
  Junping Shi (1998)- Tulane, William and Mary (tenured),
  Junping Wang (1998)- Edifecs, Washington,
  Fengxin Chen (1999)- U. Texas San Antonio (tenured),
  Sarah Brown (2004)- S. Utah Univ.,
  Jianlong Han (2005)- S. Utah Univ.,
  Guangyu Zhao (2005)- N Texas State U., U. Cincinnati,
  Chunlei Zhang (2006)- S. Utah Univ.,
  Zhiyuan Jia (current)
  Jennifer Wei (current)
  Jaylan Jones (current).