Mason A. Porter
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Curriculum Vitae

PERSONAL DATA

- Born: February 10, 1976 in Los Angeles, California, United States
- Citizenship: United States
- Languages: English, Spanish

EMPLOYMENT

- Beginning 10/07
  - University Lecturer, Oxford Centre for Industrial and Applied Mathematics, Mathematical Institute, University of Oxford
  - Tutorial Fellow, Somerville College, University of Oxford
- 6/05-9/07
  - Postdoctoral Scholar, Center for the Physics of Information and Department of Physics, California Institute of Technology
    - Advisor: Michael C. Cross (Physics)
- 8/02-5/05
  - NSF VIGRE Visiting Assistant Professor, Mathematics, Georgia Institute of Technology
    - Advisor: Leonid A. Bunimovich (Mathematics)
  - Research Associate Member, Center for Nonlinear Science, Physics, Georgia Institute of Technology
    - Advisor: Predrag Cvitanovic (Physics)
- 1/03-5/03
  - Postdoctoral Scholar, Semiclassical Analysis program, Mathematical Sciences Research Institute, Berkeley CA

EDUCATION

- Ph.D., Center for Applied Mathematics, Cornell University, 5/26/02.
  - Thesis Advisor: Richard L. Liboff (Electrical & Computer Engineering, Applied & Engineering Physics)
  - Thesis Committee: Steven H. Strogatz (Theoretical & Applied Mechanics), John Guckenheimer (Mathematics), and Gregory S. Ezra (Chemistry & Chemical Biology)
- M.S., Center for Applied Mathematics, Cornell University, 1/17/01.
- B.S. with Honors, Applied Mathematics, California Institute of Technology, 6/98.
  - Academic Advisors: Oscar P. Bruno (Applied Mathematics), Gerald B. Whitham (Applied Mathematics)
  - Undergraduate Research Mentors: Jerrold E. Marsden (Control & Dynamical Systems), Nikolai G. Makaraov (Mathematics), and Charles R. Plott (Economics)

HONORS AND GRANTS

- 2003-2004 AMS Project NExT Fellowship
- 2001 SIAM Student Paper Prize (for "An Introduction to Quantum Chaos")
- National Defense Science and Engineering Graduate (DoD) Fellowship, 8/98—8/01
- SIAM Early-Career Travel Award, International Congress on Industrial and Applied Mathematics (7/07)
- Travel Grants to attend various conferences and workshops, including Midwest Dynamical Systems Conference (3/00); Maryland-Penn State Conference on Dynamical Systems (3/01); Dynamics Days (1/02, 1/03, 1/04, 1/06); and workshops at IPAM (10/02, 2/03), MSRI (4/05), MBI (9/05), and University of Washington (9/06)

- SIAM Student Travel Award, SIAM Pacific Rim Dynamical Systems Conference, 8/00
- Graduate Student Travel Grants, Cornell University (4 of them)

RESEARCH AREA

- Applied Mathematics; Nonlinear Dynamics; Mathematical Modeling, especially in atomic, optical, and condensed matter physics; Complex Networks. Current research projects include:
  - 1. Solitary Waves in Highly Nonlinear Phononic Crystals (with C. Daraio, F. Fraternali, E. B. Herbold, P. G. Kevrekidis, D. Khatri, & I. Szelengowicz)
  - 2. A Network Analysis of the United States Congress (with J. H. Fowler, A. J. Friend, P. J. Mucha, Y. Pei, A. Waugh, & Y. Zhang)
  - 3. Nonlinearity Management of Bose-Einstein Condensates (with D. J. Frantzeskakis, P. G. Kevrekidis, A. S. Rodrigues, & P. Schmelcher)
  - 4. Synchronization in Nanomechanical Oscillators (with N. Cayco Gajic, X. Chen, M. C. Cross, M. Grau, R. Lifshitz, & J. L. Rogers)
  - 5. Eigenvector Methods for Community Detection in Networks (with P. J. Mucha, T. Richardson, & A. L. Traud)

REFEREED PUBLICATIONS

- 1. MAP, P. J. Mucha, M. E. J. Newman, & A. J. Friend [2007], "Community Structure in the United States House of Representatives", to appear in *Physica A* (arXiv: physics/0602033).
- 2. T. Callaghan, P. J. Mucha, & MAP [2007], "Random Walker Ranking for NCAA Division I-A Football", *American Mathematical Monthly*, Vol. 114, No. 9: 761-777.
- 3. M. Centurion, MAP, Y. Pu, P. G. Kevrekidis, D. J. Frantzeskakis, & D. Psaltis [2007], "Modulational Instability in Nonlinearity-Managed Optical Media", *Physical Review A*, Vol. 75, No. 063804.
- 4. MAP, P. G. Kevrekidis, D. J. Frantzeskakis, & B. A. Malomed [2007], "Modulated Amplitude Waves in Collisionally Inhomogeneous Bose-Einstein Condensates", *Physica D*, Vol. 229, No. 1: 104-115.
- 5. M. van Noort, MAP, Y. Yi, & S.-N. Chow [2007], "Quasiperiodic and Chaotic Dynamics in Bose-Einstein Condensates in Periodic Lattices and Superlattices", *Journal of Nonlinear Science*, Vol. 17, No. 1: 59-83.
- 6. H. E. Nistazakis, MAP, P. G. Kevrekidis, D. J. Frantzeskakis, A. Nicolin, & J. K. Chin [2006], "Fractional-Period Excitations in Continuum Periodic Systems", *Physical Review A*, Vol. 74, No. 063617.
- 7. M. Centurion, MAP, Y. Pu, P. G. Kevrekidis, D. J. Frantzeskakis, & D. Psaltis [2006], "Modulational Instability in a Layered Kerr Medium: Theory and Experiment", *Physical Review Letters*, Vol. 97, No. 23: 234101.
- 8. MAP, M. Chugunova, & D. E. Pelinovsky [2006], "Feshbach Resonance Management of Bose-Einstein Condensates in Optical Lattices", *Physical Review E*, Vol. 74, No. 036610.
- 9. M. Centurion, MAP, P. G. Kevrekidis, & D. Psaltis [2006], "Nonlinearity Management in Optics: Experiment, Theory, and Simulation", *Physical Review Letters*, Vol. 97, No. 3: 033903.
- 10. V. P. Chua & MAP [2006], "Spatial Resonance Overlap in Bose-Einstein Condensates in Superlattice Potentials", *International Journal of Bifurcation and Chaos*, Vol. 16, No. 4: 945-959.
- 11. S. Lansel, MAP, & L. A. Bunimovich [2006], "One-Particle and Few-Particle Billiards", *Chaos*, Vol. 16, No. 1: 013129.
- 12. MAP, P. G. Kevrekidis, R. Carretero-González, & D. J. Frantzeskakis [2006], "Dynamics and Manipulation of Matter-Wave Solitons in Optical Superlattices", *Physics Letters A*, Vol. 352: 210-215.
- 13. MAP & P. G. Kevrekidis [2005], "Bose-Einstein Condensates in Superlattices", *SIAM Journal on Applied Dynamical Systems*, Vol. 4, No. 4: 783-807.
- 14. MAP, P. J. Mucha, M. E. J. Newman, and C. M. Warmbrand [2005], "A Network Analysis of Committees in the United States House of Representatives", *Proceedings of the National Academy of Sciences*, Vol. 102, No. 20: 7057-7062.
- 15. MAP, R. Carretero-González, P. G. Kevrekidis, and B. A. Malomed [2005], "Nonlinear Lattice Dynamics of Bose-Einstein Condensates", *Chaos*, Vol. 15, No. 1: 015115.
- 16. MAP & P. Cvitanovic [2004], "A Perturbative Analysis of Modulated Amplitude Waves in Bose-Einstein Condendsates", *Chaos*, Vol. 14, No. 3: 739-755.
- 17. MAP, P. G. Kevrekidis, & B. A. Malomed [2004], "Resonant and Non-Resonant Modulated Amplitude Waves for Binary Bose-Einstein Condensates in Periodic Lattices", *Physica D*, Vol. 196, No. 1-2: 106-123.
- 18. R. L. Liboff & MAP [2004], "Energy Absorption and Dissipation in Quantum Systems", *Physica D*, Vol. 195, No. 3-4: 398-402.
- 19. MAP & P. Cvitanovic [2004], "Modulated Amplitude Waves in Bose-Einstein Condendsates", *Physical Review E*, Vol.

69, No. 047201.

- 20. MAP & R. L. Liboff [2002], "A Galërkin Approach to Electronic Near-Degeneracies in Molecular Systems", *Physica D* , Vol. 167, No. 3-4: 218-247.
- 21. R. L. Liboff, N. Weimann, and MAP [2002], "Prime Quasientropy and Quasichaos", *International Journal of Theoretical Physics*, Vol. 41, No. 7, pp. 1389-1395.
- 22. MAP [2001], "Nonadiabatic Dynamics in Semiquantal Physics", *Reports on Progress in Physics*, Vol. 64, No. 9: 1165-1189.
- 23. MAP & R. L. Liboff [2001], "Quantum Chaos for the Vibrating Rectangular Billiard", *International Journal of Bifurcation and Chaos*, Vol. 11, No. 9: 2317-2337.
- 24. MAP & R. L. Liboff [2001], "Vibrating Quantum Billiards on Riemannian Manifolds", *International Journal of Bifurcation and Chaos*, Vol. 11, No. 9: 2305-2315.
  - Note: Papers 23 and 24 constitute the cover story of the 9/01 issue of *IJBC*.
- 25. MAP & R. L. Liboff [2001], "Bifurcations in One Degree-of-Vibration Quantum Billiards", *International Journal of Bifurcation and Chaos*, Vol. 11, No. 4: 903-911.
- 26. MAP & R. L. Liboff [2001], "The Radially Vibrating Spherical Quantum Billiard", *Discrete and Continuous Dynamical Systems*, Special Issue on Y2K International Conference on Dynamical Systems and Differential Equations: 310-318.
- 27. R. L. Liboff & MAP [2000], "Quantum Chaos for the Radially Vibrating Spherical Billiard", *Chaos*, Vol. 10, No. 2: 366-370.

PAPERS UNDER REVIEW

- 1. T. Mainiero & MAP [2007], "Quantization of a Free Particle Interacting Linearly with a Harmonic Oscillator", submitted to *Chaos* (arXiv: nlin.CD/0702025).
- 2. R. Barnett, G. Refael, MAP, & H. P. Büchler [2007], "Vortex Lattice Locking in Rotating Two-Component Bose-Einstein Condensates", submitted to *Physical Review Letters* (arXiv: 0705.2426).
- 3. MAP, C. Daraio, E. B. Herbold, I. Szelengowicz, & P. G. Kevrekidis [2007], "Highly Nonlinear Solitary Waves in Periodic Dimer Granular Chains", submitted to *Physical Review Letters* (arXiv: 0705.3471).
- 4. Y. Zhang, A. J. Friend, A. L. Traud, MAP, J. H. Fowler, & P. J. Mucha [2007], "Community Structure in Congressional Cosponsorship Networks", submitted to *Physica A* (arXiv: 0708.1191).

PAPERS IN PREPARATION

- 1. MAP, I. Szelengowicz , C. Daraio, E. B. Herbold , & P. G. Kevrekidis [2007], "Highly Nonlinear Solitary Waves in Heterogeneous Periodic Phononic Crystals".
- 2. MAP [2007], "Trials and Tribulations with the Singular Value Decomposition" (expository article).
- 3. MAP, N. J. Zabusky, B. Hu, & D. K. Campbell [2007], "The Fermi-Pasta-Ulam Problem: Celebrating the Origins of Computational and Nonlinear Science" (expository article).
- 4. A. S. Rodrigues, P. G. Kevrekidis, MAP, D. J. Frantzeskakis, & P. Schmelcher [2007], "Solitary Matter Waves Under the Effect of Piecewise Constant Nonlinearity".
- 5. Y. Pu, MAP, M. Centurion, P. G. Kevrekidis, D. J. Frantzeskakis, & D. Psaltis [2007], "Ring structures in pulse propagation in layered Kerr media".

EXPOSITORY PUBLICATIONS

- 1. MAP [2007], "Life on Both Sides of the Fence: Mentoring Versus Being Mentored", in *Proceedings of the Conference on Promoting Undergraduate Research in Mathematics* (Joe Gallian, Editor), American Mathematical Society: 349-354 (extended version available at arXiv: physics/0611046).
- 2. MAP & S. Lansel [2006], "Mushroom Billiards", *Notices of the American Mathematical Society*, Vol. 53, No. 3: 334-337 (cover article).
- 3. MAP & P. Cvitanovic [2005], "Ground Control to Niels Bohr: Exploring Outer Space with Atomic Physics", *Notices of the American Mathematical Society*, Vol. 52, No. 9: 1024-1025.
- 4. T. Callaghan, P. J. Mucha, & MAP [2004], "The Bowl Championship Series: A Mathematical Review", *Notices of the American Mathematical Society*, Vol. 51, No. 8: 887-893.
- 5. MAP [2003], "Quantitative Literacy: Overcoming the Fear of Mathematics", *Beverly Hills Weekly*, No. 200 (7/31/03—8/06/03).

- 6. MAP [2002], "Graduate Student Seminars: Encouraging Student Participation and Developing Essential Research Skills using Cookies, Doughnuts, and Mathematics", *Notices of the American Mathematical Society*, Vol. 49, No. 11: 1357.
- 7. S. Wirkus & MAP [2002], "SIAM Hears from Next-Generation Mathematical Biologists at Philadelphia Meeting", *SIAM News*, Vol. 35, No. 8.
- 8. MAP [2001], "A Next-Generation Scientist's Impression: Recent Trends in Nonlinear Dynamics", *SIAM News*, Vol. 34, No. 4.
- 9. MAP & R. L. Liboff [2001], "Chaos on the Quantum Scale", *American Scientist*, Vol. 89, No. 6 (Cover article): 532-537, reprinted in *PowerWeb: Conceptual Physics* (The McGraw-Hill Companies, 2003), translated into German in 3/03 issue of *Spektrum der Wissenschaft*, translated into Spanish and appeared in 4/03 issue (Number 319) of *Investigacion y Ciencia*.

OTHER SCIENTIFIC PUBLICATIONS

- 1. T. Mainiero & MAP [2007], "Avoided Level Crossings in the Quantization of a Mixed Regular-Chaotic System", to appear in *Chaos* (Gallery of Nonlinear Images).
- 2. MAP, A. J. Friend, P. J. Mucha, & M. E. J. Newman [2006], "Community Structure in the U.S. House of Representatives", *Chaos*, Vol. 16, No. 4: 041106 (Gallery of Nonlinear Images).
- 3. G. Mayer-Kress & MAP [2001], "Remarks on Whale Culture from a Complex Systems Perspective", *Behavior and Brain Sciences*, Vol. 24, No. 2: 344 (commentary).

SOFTWARE

- 1. S. Lansel & MAP [2004], "A GUI Billiard Simulator for Matlab" (with 2006 updates by K. Kazlowski); Documentation available at arXiv: nlin.CD/0405003; software available at http://www.its.caltech.edu/~mason/papers/

DOCTORAL DISSERTATION

- MAP [2002], "Quantum Chaos in Vibrating Billiard Systems", Center for Applied Mathematics, Cornell University

BOOK (non-scientific)

- A. H. Looijen & MAP [2007], *Legends of Caltech III: Techer in the Dark*, published by the Caltech Alumni Association (author order is alphabetical). Additional online content is available at *www.legendsofcaltech.com.*

COVER ARTICLES AND PRESS COVERAGE

- Cover articles
  - *Notices of the American Mathematical Society* (3/06)
  - *American Scientist* (11-12/01)
  - *International Journal of Bifurcation and Chaos* (9/01)
- Research on nonlinearity management in optics featured in *Physical Review Focus* (7/10/06), a Caltech press release (8/04/06), *Photonics Spectra* (10/06), and *Engineering & Science* (a Caltech publication; Vol. LXIX, No. 3, 2006).
- Research on network analysis of the U.S. House of Representatives featured in a Georgia Tech press release (5/16/05), *ScienceNow* (5/16/05), *New Scientist* (5/17/05), the *Associated Press* (6/10/05), *Bulletin of the Atomic Scientists* (9-10/05), and a "Mathematical Moment" (MM/54) published by the American Mathematical Society.
- Research on random walker rankings for college football featured in *ESPN: The Magazine* (11/10/03), *Nature Science Update* (11/14/03), a Georgia Tech press release (11/18/03), *The Chronicle of Higher Education* (11/28/03), CNN Headline News (12/30/03), the *Atlanta-Journal Constitution* (4/24/04), an American Mathematical Society press release (8/4/04), the MathTrek section of *Science News* online (9/4/04, Vol.166, No. 10), and *The Washington Post* (12/10/05).
- Expository article on transition states in atomic and celestial physics featured in an American Mathematical Society press release (8/31/05), the MathTrek section of *Science News* online (9/9/05, Vol. 168, No. 11), a Georgia Tech press release (9/28/05), a National Science Foundation press release (9/29/05), and *Science* (11/18/05). The American Mathematical Society also published a "Mathematical Moment" based on this article (MM/49).

CONSULTING

- Mathematical Consultant, *Starship Dave*, 20th Century Fox (to be released in 2008).

UNDERGRADUATE RESEARCH SUPERVISION

- Caltech
  - 1. Xi ("Sherry") Chen, Physics, "Antiferromagnetic Synchronization in Nanomechanical Oscillators", joint with M. C. Cross (Dept. of Physics) and J. L. Rogers (Applied & Computational Physics, HRL Laboratories), Summer 2007.
  - 2. Natasha ("Alex") Cayco Gajic, Applied & Computational Mathematics, "Synchronization Basins in Coupled Phase Oscillators", joint with M. C. Cross (Dept. of Physics) and J. L. Rogers (Applied & Computational Physics, HRL Laboratories), Summer 2007.
  - 3. Matt Grau, Physics, Synchronization in Small Numbers of Coupled Nanomechanical Oscillators", joint with M. C. Cross (Dept. of Physics) and J. L. Rogers (Applied & Computational Physics, HRL Laboratories), Summer 2007.
  - 4. Olga Mandelshtam, "Growth Models of Social Networks", Summer 2007.
  - 5. Liuyi ("Ye") Pei, Physics, "Detecting Community Structure in the U.S. Congress", Summer 2007.
  - 6. Yan Zhang, Mathematics, "Community Structure in Congressional Networks", Summer 2006.
  - 7. Thomas Mainiero, Physics, "Quantization of a Free Particle Interacting Linearly with a Harmonic Oscillator", Summer 2006.
  - 8. William ("Austin") Webb, Applied Mathematics, "A Computational Study of the Quantization of Billiards with Mixed Dynamics", Summer 2006.
  - 9. Kris Kazlowski, Mathematics, "Periodic Orbits in Generalized Mushroom Billiards", Summer 2006.
  - 10. Tatjana Wiese, Mathematics, "Faraday Patterns in Bose-Einstein Condensates", Summer 2006.
  - 11. Eric Kelsic, Physics, "Community-Finding Algorithms in Complex Networks", Summer 2005.
    - Placement: Starting Ph.D. program in systems biology at Harvard University in Fall 2008. (Currently spending a year teaching English in China.)
  - 12. Sean Li, Mathematics, "A Perturbative Analysis of Plankton Population Dynamics", Summer 2005.
- Georgia Tech
  - 1. A. J. Friend, Discrete Mathematics, "Hierarchical Clustering in Complex Networks", joint with P. J. Mucha (Dept. of Mathematics), Spring 2005—Spring 2006.
  - 2. Udbhav ("Woody") Sharma, Aerospace Engineering, joint with S. Peles (Dept. of Physics), "Hopf Bifurcations Near the Flutter Speed in Airfoils", Fall 2004—Spring 2005.
    - Placement: Currently working at the Liquid Propulsion Systems Center of the Indian Space Research Organization.
  - 3. Jennifer Rieser, Physics, joint with S. Peles (Dept. of Physics), "Transient Amplification and Contact Line Instabilities in Spreading of Thin Liquid Films", Fall 2004—Spring 2005.
    - Placement: Currently a Ph.D. student in physics at Cornell University.
  - 4. Stephanie Chung, Applied Mathematics and Caroline Seabrook, Applied Mathematics, "Singular Value Decompositions, Information, and Entropy", joint with S.-N. Chow (Dept. of Mathematics), Summer 2004—Spring 2005.
    - Placement (Chung): Currently working as in actuary at Safeco.
    - Placement (Seabrook): Currently a Ph.D. student in statistics at North Carolina State University.
  - 5. Julie Bjornstad, Discrete Mathematics and Alexei ("Leo") Dachevski, Electrical & Computer Engineering and Applied Mathematics, "Dynamics of Plankton Food Chains in the Presence of Seasonal Variation and Fluctuations in Resource Availability", joint with C. Klausmeier (Dept. of Biology) and L. A. Bunimovich (Dept. of Mathematics), Summer 2004—Spring 2005.
    - Placement (Bjornstad): Currently a Masters student in urban/regional planning at UNC Chapel Hill.
    - Placement (Dachevski): Currently a Ph.D. student in algorithms, combinatorics, and optimization at Georgia Tech.
  - 6. Adrianne Stroup, visiting student from Caltech, "Dynamics of the Triple Pendulum" (through Caltech's Summer Undergraduate Research Fellowship program), Summer 2004.
  - 7. Vivien Chua, Electrical and Computer Engineering, "Cubic-Quintic Duffing Oscillators", Fall 2003 and "Spatial Resonances in Bose-Einstein condsenation in superlattices", Spring 2004—Fall 2004.
    - Placement: Currently a Ph.D. student in applied mathematics at Stanford University.
  - 8. Jeremy Corbett, Applied Mathematics and Behram Mistree, visiting student from MIT, "Pattern Formation in Periodically Forced Granular Media using Continuum Coupled Maps", joint with S.-N. Chow (Dept. of Mathematics), Summer 2003.
    - Placement (Corbett): Currently spending a year teaching English in Korea.

- 9. Casey Warmbrand, Discrete Mathematics, "Community Structure in Congressional Networks", joint with P. J. Mucha (Dept. of Mathematics), Summer 2003—Fall 2003.
  - Placement: Currently a Ph.D. student in mathematics at University of Arizona.
- 10. Jessica Snyder, Applied Mathematics, "Liénard Oscillator Models of Bipolar Disorder", Summer 2003.
  - Placement: Currently working at Science Applications International Corporation.
- 11. Thomas Callaghan, Applied Mathematics, "Ranking Division I-A College Football Teams Using Random Walkers on the BCS Network", joint with P. J. Mucha (Dept of Mathematics), Summer 2003—Fall 2004.
  - Placement: Currently a Ph.D. student in applied mathematics at Stanford University.
- 12. Steven Lansel, Electrical & Computer Engineering and Applied Mathematics, "A Graphical User Interface for Simulating Classical Billiards", Summer 2003—Spring 2004 and "Elliptical Mushroom Billiards", joint with L. A. Bunimovich (Dept. of Mathematics), Fall 2004—Spring 2005.
  - Placement: Currently a Ph.D. student in electrical engineering at Stanford University.

- Mathematical Theoretical Biological Institute (MTBI) projects, Cornell University
  - 1. Summer 2002: Mathematical Modeling of Bipolar Disorder
  - 2. Summer 2001: Buckling of Fibers

TALKS

- Invited Conference Presentation
  - "Bose-Einstein Condensates in Lattice and Superlattice Potentials": The National Center for Theoretical Sciences (NCTS), Taiwan, International Conference on Chaos and Dynamical Complexity, 5/16/05-5/20/05
  - "Solitons and Coherent Structures in Bose-Einstein Condensates": Focus Session on "Solitons and Applications in the 50 Years since Fermi-Pasta-Ulam", American Physical Society (APS) March Meeting, 3/23/05
- Minisymposium Conference Presentations
  - "Wave Propagation in Phononic Crystals"
    - 2008 AMS/MAA Joint Mathematics Meetings, 1/08
  - "Community Structure in the United States House of Representatives"
    - 2007 SIAM Conference on Applications of Dynamical Systems, 5/07
  - "Bose-Einstein Condensates in Optical Lattices and Superlattices"
    - 2006 SIAM Annual Meeting, 7/06
    - 2006 AMS/MAA Joint Mathematics Meetings, 1/06
    - 2004 SIAM Annual Meeting, 7/04
  - "Modulated Amplitude Waves in Bose-Einstein Condensation"
    - 2003 SIAM Annual Meeting, 6/03
    - 2003 SIAM Conference on Applications of Dynamical Systems, 5/03
  - "How Well Can Random Walkers Rank Football Teams?"
    - 2006 AMS/MAA Joint Mathematics Meetings, 1/06
  - "An Introduction to Quantum Chaos": 2001 SIAM Annual Meeting, 7/01
- Workshop Presentations
  - "Nonlinearity Management in Optics": MSRI Introductory Workshop on Dynamical Systems with Emphasis on Extended Systems, 1/22/07-1/26/07
  - "Bose-Einstein Condensates in Optical Lattices and Superlattices": Nonlinearities – from Turbulent to Magic, Niels Bohr Institute, Denmark, 5/06
  - "A Network Analysis of Committee Assignments in the United States House of Representatives": MSRI Workshop on Models of Real-World Random Networks, 4/18/05-4/22/05
- Contributed Conference Presentations
  - "Computational Linear Algebra and Social Networks"
    - 2008 AMS/MAA Joint Mathematics Meetings, 1/08
  - "Nonlinearity Management in Optics"
    - 2007 International Congress on Industrial and Applied Mathematics, 7/07
  - "Bose-Einstein Condensates in Optical Lattices and Superlattices" (and related topics)
    - 2007 AMS/MAA Joint Mathematics Meetings, 1/07
    - 2006 SIAM Conference on Nonlinear Waves and Coherent Structures, 9/06
    - 2004 SIAM Conference on Nonlinear Waves and Coherent Structures, 10/04
    - 2004 SIAM Annual Meeting, 7/04
    - 91st Statistical Mechanics Conference; Rutgers, NJ, 5/04
    - 2004 AMS/MAA Joint Mathematics Meetings, 1/04

        - Dynamics Days, 1/03
    - "Billiards with Mixed Regular and Chaotic Dynamics": 2007 AMS/MAA Joint Mathematics Meetings, 1/07
    - "Community Structure in the United States Congress": 2007 AMS/MAA Joint Mathematics Meetings, 1/07
    - "A Network Analysis of Committee Assignments in the United States House of Representatives"
        - 2006 SIAM Annual Meeting, 7/06
        - 2006 APS March Meeting, 3/06
        - Dynamics Days 2006, 1/06
        - 2006 AMS/MAA Joint Mathematics Meetings, 1/06
    - "How Well Can Random Walkers Rank Football Teams?": 2004 SIAM Annual Meeting, 7/04
    - "Quantum Chaos in Vibrating Billiard Systems"
        - 2002 SIAM Annual Meeting, 7/02
        - 6th SIAM Conference on Applications of Dynamical Systems, 5/01
        - Y2K International Conference on Differential Equations and Dynamical Systems, Kennesaw State University, 5/00
- Seminars at Universities
    - "Wave Propagation in Phononic Crystals"
        - University of Surrey, Informal Seminar, Department of Mathematics, 10/31/07
        - University of Oxford, Differential Equations and Applications Seminar, Mathematical Institute, 10/25/07
    - "Nonlinearity Management in Optics, Phononic Crystals, and Bose-Einstein Condensation" (and similar topics)
        - University of Cambridge, Mechanics and Mathematical Biology Seminar, Department of Applied Mathematics and Theoretical Physics, 10/22/07
        - University of Oxford, Mathematical Institute, 10/27/06
    - "Complex Networks: From Congress to College Football"
        - University of Oxford, Complex Agent-Based Dynamic Networks (CABDyN) Seminar, 11/13/07
        - University of Southern California, Informal Nonlinear Dynamics Seminar, Department of Aerospace & Mechanical Engineering, 9/06/07
        - California Institute of Technology, Condensed Matter Theory Group Meeting, 5/14/07
        - California Institute of Technology, Undergraduate Math Club Seminar, 4/04/07
        - Louisiana Tech University, Mathematics Colloquium, 1/09/07
        - Loyola Marymount University, Mathematics Colloquium, 11/13/06
        - Claremont Colleges, Mathematics Colloquium, 11/01/06
    - "A Network Analysis of Committee Assignments in the United States House of Representatives"
        - Georgia Tech, Applied and Computational Mathematics Colloquium, School of Mathematics, 4/26/05
    - "Bose-Einstein Condensates in Optical Lattice and Superlattice Potentials" (and related subjects)
        - University of Durham, Atomic and Molecular Physics Research Seminar, Department of Physics, 11/28/07
        - UCLA, Applied Mathematics Colloquium, Department of Mathematics, 10/11/06
        - Niels Bohr Institute, Atomic Physics Seminar, 5/17/06
        - Caltech, Institute for Quantum Information Seminar, 5/2/06
        - Caltech, Condensed Matter Physics Seminar, Department of Physics, 2/24/06
        - University of Maryland at College Park, Applied Dynamics Seminar, 2/9/06
        - University of North Carolina at Chapel Hill, Applied Mathematics Colloquium, Department of Mathematics, 12/2/05
        - Caltech, SIAM Student Seminar, Department of Applied & Computational Mathematics, 11/18/05
        - University of Massachusetts at Amherst, Applied Analysis & Computation Seminar, Department of Mathematics & Statistics, 10/18/05
        - Georgia Tech, Nonlinear Science Seminar, School of Physics, 8/26/05
        - University of Sydney, School of Mathematics & Statistics, 4/8/05
        - McMaster University, Department of Mathematics, 3/29/05
        - UC Merced, School of Natural Sciences, 3/18/05
        - The Ohio State University, Department of Mathematics, 2/18/05
        - Southern Methodist University, Department of Mathematics, 2/3/05
        - Clemson University, Department of Mathematical Sciences, 1/31/05
        - UC Davis, Department of Mathematics 1/04/05
        - Caltech, Department of Control and Dynamical Systems, 1/29/04
        - Georgia Tech, Center for Nonlinear Science (CNS) meeting, School of Physics, 10/27/03
        - Georgia Tech, Center for Dynamical Systems and Nonlinear Studies (CDSNS), School of Mathematics, 10/20/03
    - "An Introduction to the Fermi-Pasta-Ulam Problem and Solitary Waves"
        - Georgia Tech, Center for Nonlinear Science (CNS) meeting, School of Physics, 11/29/04 and 12/06/04
    - "How Well Can Random Walkers Rank Football Teams?"

        - Cal Poly Pomona, Department of Mathematics and Statistics, 6/03/04
    - "Periodic Orbits and Spectral Statistics of Quantum Graphs"
        - Georgia Tech, Combinatorics Seminar, School of Mathematics, 11/02
    - "Modeling Nanostructures with Quantum Billiards"
        - University of Illinois at Urbana Champaign, Department of Mechanical and Industrial Engineering, 2/21/02

TEACHING

- Courses Taught, University of Oxford
    - 2007-2008 academic year
        - Maths B5b ("Applied Partial Differential Equations: Supplementary Lectures", half course) [expected]
        - Michaelmas 2007: Maths C6.3a ("Perturbation Methods")
- Course Development, Georgia Institute of Technology
    - Introduction to Mathematical Modeling (advanced undergraduate course, taught at Georgia Tech, Spring 2004)
- Courses Taught, Georgia Institute of Technology
    - Spring 2005: Math 2403 ("Introduction to Differential Equations")
    - Fall 2004: Math 6705 ("Modeling and Dynamics")
    - Spring 2004: Math 4803POR ("Introduction to Mathematical Modeling")
    - Fall 2003: Math 4320 ("Complex Analysis")
    - Fall 2002: Math 2401 ("Calculus III"—vector calculus)
- Teacher's Assistant, Cornell University
    - Spring, 2002: Math 420 (Differential Equations and Dynamical Systems)
    - Fall, 2001: Math 615 (Mathematical Methods in Physics)
    - Summers, 2000-2002: Mathematical Theoretical Biology Institute summer research program for undergraduates
- Courses Taught, California Institute of Technology
    - Spring 1997: Ma 1d (Probability)
- Teacher's Assistant, California Institute of Technology
    - Spring 1998: Ma 1c-practical track (Linear Algebra/Multivariable Calculus—continued)
    - Winter 1998: Ma 1b-practical track (Linear Algebra/Multivariable Calculus)
    - Fall 1997: Ma 2a-practical track (Matrix Theory/Statistics)
    - Winter 1997: Ma 1b-practical track (Differential Equations/Linear Algebra)
    - Fall 1996: Ma 1a (Calculus/Probability)

SERVICE

- Seminar Organization
    - Georgia Tech
        - Co-organizer: Center for Dynamical Systems and Nonlinear Studies Colloquium (Fall 2004-Spring 2005) [with S.-N. Chow]
        - Organizer: Public lecture and book signing (at Georgia Tech) by Steve Strogatz (9/29/04)
        - Organizer: Research Horizons Seminar (Fall 2003-Spring 2004)
    - Cornell
        - Founder: Mathematical Sciences Graduate Student Seminar Series (8/00)
        - Organizer: Mathematical Sciences Graduate Student Seminar Series (8/00-12/01)
        - Organizer: Bill Sears Club seminar series (8/99-12/99)
- Sessions Organized at Conferences
    - Project NExT Session on "New Technologies for Faculty: Wikis, Discussion Boards, and Clickers", 2008 AMS/MAA Joint Mathematics Meetings (with H. Zullo, Carroll College), 1/08
    - Minisymposium on "Complex Networks: Dynamics and Community Detection", 2007 SIAM Conference on Applications of Dynamical Systems (with P. J. Mucha), 5/07
    - Minisymposium on "Analysis, Computation, and Experiments in Bose-Einstein Condensation", 2006 SIAM Annual Meeting and 2006 SIAM Conference on Analysis of Partial Differential Equations (with P. G. Kevrekidis), 7/06
    - Minosymposium on "Theoretical Biology and Dynamical Systems", 2005 SIAM Annual Meeting (with C. Castillo-Chavez, C. Kribs Zaleta, B. Song, and A.-A. Yakubu), 7/05
    - Focus Session on "Solitons and Applications in the 50 Years since Fermi-Pasta-Ulam", 2005 APS March Meeting (with D. Campbell and N. Zabusky), 3/05

- Minisymposium on "Nonlinear Waves and Pattern Formation in Biological Systems", 2004 SIAM Conference on Nonlinear Waves and Coherent Structures (with P. G. Kevrekidis), 10/04
- Minisymposium on "Applications of Discrete and Continuous Dynamical Systems", 2004 SIAM Annual Meeting (with S. Wirkus), 7/04
- Minisymposium on "Theoretical Biology and Nonlinear Dynamics" and "Applications of Nonlinear Oscillators", 2003 SIAM Annual Meeting (with S. Wirkus), 6/03
- Minisymposium on "Applications of Forced and Coupled Nonlinear Oscillators", 2003 SIAM Conference on Applications of Dynamical Systems, 5/03
- Minisymposium on "Theoretical Biology and Nonlinear Dynamics", 2002 SIAM Annual Meeting (with S. Wirkus), 7/02

- Refereed papers for the following journals: *Chaos*, *Discrete and Continuous Dynamical Systems*, *International Journal of Bifurcation and Chaos*, *Journal of Physics A: Mathematical and General*, *Journal of Physics B: Atomic Molecular and Optical Physics*, *Mathematics and Computers in Simulation*, *Physica D*, *Physical Review A*, *Physical Review E*, *Physical Review Letters*, *Physics Letters A*
- Refereed a book for the following publisher: Princeton University Press
- Contributing Editor, Complexity Digest (4/01—12/03)
- Panelist, Project NExT Session on Designing Courses in Mathematical Modeling, MAA MathFest, 8/04

ORGANIZATION MEMBERSHIPS

- Society for Industrial and Applied Mathematics, American Mathematical Society, Mathematical Association of America, American Physical Society, Sigma Xi (scientific honor society), Tau Beta Pi (engineering honor society)