Curriculum Vitae: J. M. Schwarz

Contact Information

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Education

9/94 – 8/01 **Harvard University** **Cambridge, MA**
M.A. in physics, March 2002
Ph.D. in physics, March 2002
Thesis Title: Depinning with Elastic Waves: Criticality, Hysteresis, and even Pseudohysteresis
Advisor: Prof. Daniel S. Fisher

9/88 – 12/89, 1/91-6/94 **University of Maryland, College Park** **College Park, MD**
B.A. in history; B.S. in physics
High honors in history and in physics; magna cum laude

Employment

9/05 – Present **Syracuse University** **Syracuse, NY**
Assistant Professor: Correlated classical and quantum percolation, modelling the morphology and rheology of actin cytoskeletal networks

9/03 – 9/05 **University of Pennsylvania/University of California at Los Angeles Philadelphia, PA/ Los Angeles, CA**
Post-doc: Working with Prof. Andrea Liu on jamming and the kinetics of actin self-assembly

10/01 – 8/03 **Syracuse University** **Syracuse, NY**
Post-doc: Worked with Profs. Cristina Marchetti and Alan Middleton on viscoelastic and plastic depinning transitions, spin glasses, and computational complexity

9/94 – 9/01 **Harvard University** **Cambridge, MA**
Research Assistant: Worked on dynamical critical phenomena as well as mesoscopics with Prof. Daniel Fisher

Teaching: Courses ranging from introductory physics for majors and non-majors to undergraduate quantum mechanics and statistical mechanics

6/93 – 6/94 **University of Maryland, College Park** **College Park, MD**
Undergraduate Researcher: Worked on nuclear theory, more precisely, a quantum mechanical approach to a high energy scattering phenomenon known as color transparency, as well as X-ray crystallography

Publications

(1) J. M. Schwarz and Ron Maimon, "First-Passage Time Exponent for Higher-Order Random Walks: Using Levy Flights," *Phys. Rev. E* **64**, 16120 (2001); arXiv:cond-mat/0103220.

(2) J. M. Schwarz and Daniel S. Fisher, "Depinning with Dynamic Stress Transfer: Mean Field Theory," *Phys. Rev. Lett.* **87**, 96107 (2001); arXiv:cond-mat/0012246.

(3) J. M. Schwarz and Daniel S. Fisher, "Depinning with Dynamic Stress Overshoots: A Hybrid of Critical and Pseudohysteretic Behavior," *Phys. Rev. E* **67**, 021603 (2003); arXiv:cond-mat/0204063.

(4) M. Cristina Marchetti, A. Alan Middleton, Karl Saunders and J. M. Schwarz, "Driven Depinning of Strongly Disordered Media and Anisotropic Mean Field Limits," *Phys. Rev. Lett.* **91**, 107002 (2003); arXiv:cond-mat/0302275.

(5) Ron Maimon and J. M. Schwarz, "Continuous Depinning Transition with an Unusual Hysteresis Effect," *Phys. Rev. Lett.* **92**, 255502 (2004); arXiv:cond-mat/0301495.

(6) Karl Saunders, J. M. Schwarz, M. Cristina Marchetti, and A. Alan Middleton, "Mean-field Theory of Collective Transport with Phase Slips," *Phys. Rev. B* **70**, 024205 (2004); arXiv:cond-mat/0302275.

(7) J. M. Schwarz and A. Alan Middleton, "Percolation of Unsatisfiability in Finite Dimensions," *Phys. Rev. E* **70**, 035103 (2004); arXiv:cond-mat/0309240.

(8) A. B. Harris and J. M. Schwarz, "$1/d$ Expansion for k-core Percolation," *Phys. Rev. E* **72**, 046123 (2005); arXiv:cond-mat/0505329.

(9) J. M. Schwarz, A. J. Liu, and L. Q. Chayes, "The Onset of Jamming as the Sudden Emergence of the Infinite k-core Cluster," *Europhys. Lett.* **73**, 560 (2006); arXiv:cond-mat/0410595.

(10) A. Teplyakov, K. Lim, P. P. Zhu, G. Kapadia, C. C. H. Chen, J. Schwarz, A. Howard, P. T. Reddy, A. Peterkofsky, and O. Herzberg, "Structure of phosphorylated enzyme I, the phosphoenolpyruvate: Sugar phosphotransferase system sugar translocation signal protein," *PNAS* **103**, 16218 (2006). [Note: Schwarz's contribution was made a number of years ago during first hands on experience with science working in an X-ray crystallography group led by Herzberg.]

(11) M. Jeng and J. M. Schwarz, "Comment on Jamming Percolation and Glass Transitions in Lattice Models.", *Phys. Rev. Lett.* **98**, 129601 (2007); arXiv:cond-mat/0612484.

(12) A. Gopinathan, K.- C. Lee, J. M. Schwarz, and A. J. Liu, "Branching, Capping, and Severing in Dynamic Actin Structures", *Phys. Rev. Lett.* **99**, 058103 (2007); cond-mat/0703409.

(13) M. Jeng and J. M. Schwarz, "On the study of jamming percolation", *J. Stat. Phys.* **131**, 575 (2008); arXiv:0708.0582.

(14) M. Jeng, M. Bowick, W. Krauth, J. M. Schwarz, and X. Xing, "Vacancy diffusion in the triangular lattice dimer model", *Phys. Rev. E* **78**, 021112 (2008); arXiv:0801.4718.

(15) M. Jeng and J. M. Schwarz, "On the study of force-balance percolation", *Phys. Rev. E* **81**, 011134 (2010); arXiv:0806.1552.

(16) M. Jeng, S.-Y. Xu, E. Hawkins and J. M. Schwarz, "On the nonlocality of fractional Schrodinger equation", *J. Math. Phys.* **51**, 062102 (2010); arXiv:0810.1543.

(17) L. Cao and J. M. Schwarz, "Quantum k-core conduction on the Bethe lattice", *Phys. Rev. B* **82**, 104211 (2010); arXiv:1005.4673.

(18) K.-C. Lee, A. Gopinathan, and J. M. Schwarz, "Modelling *in vitro* filopodia formation", *J. Math. Biol.* **63**, 229 (2011); arXiv:0909.2594.

(19) D. Quint and J. M. Schwarz, "Optimal orientation in cytoskeletal networks", *J. Math. Biol.* **63**, 735 (2011); arXiv:1008.1091.

(20) S.-Y. Xu and J. M. Schwarz, "Vicious accelerating walkers", *Europhys. Lett.* **96**, 50009 (2011); arXiv:1108.2490.

(21) M. Das, D. A. Quint, and J. M. Schwarz, "Cooperativity and redundancy in the mechanics of compositely crosslinked filamentous newtorks", *PLoS ONE* **7**:e35939 (2012); arXiv:1106.3004.

(22) L. Cao and J. M. Schwarz, "Level statistics of quantum k-core percolation", *Phys. Rev. B* **86**, 064206 (2012).

(23) L. Cao and J. M. Schwarz, "Correlated percolation and tricriticality", *Phys. Rev. E* **86** 061131 (2012).

(24) E. Hawkins and J. M. Schwarz, Comment on "On the consistency of solutions of the space fractional Schrodinger equation", *J. Math. Phys.* **55**, 014101 (2013).

(25) S.-L.-Y. Xu and J. M. Schwarz, "Contact processes in crowded environments", *Phys. Rev. E* **88**, 052130 (2013); arXiv:1304.1740.

(26) J. H. Lopez, L. Cao, and J. M. Schwarz, "Jamming graphs: A local approach to global mechanical rigidity", *Phys. Rev. E* **88**, 062130 (2013); arXiv: 1306.4639.

Pre-prints

(1) S.-Y. Xu, X. Illa, and J. M. Schwarz, "Force network analysis of a jammed solid", arXiv:1008.4568.

Pre-prints Under Review

(1) Dapeng Bi, J. H. Lopez, J. M. Schwarz, and M. Lisa Manning, "Energy barriers govern glassy dynamics in tissues", submitted to *Phys. Rev. Lett.* (2013); arXiv:1308.3891.

(2) T. Zhang, R. Sknepnek, M. J. Bowick, and J. M. Schwarz, "On modeling endocytosis in yeast", submitted to *Soft Matter* (2013); arXiv:1310.8652.

Pre-prints In Preparation

(1) J. H. Lopez and J. M. Schwarz, "Correlated percolation in hyperbolic geometries".

(2) J. H. Lopez, Moumita Das, and J. M. Schwarz, "Active elastic dimers: Cells crawling along featureless tracks".

(3) D. Quint and J. M. Schwarz, "On the buckling of branched cytoskeletal elements".

Awards

(1) NSF CAREER Award, NSF-0645373, 2007-2012

Invited Talks

(1) APS March Meeting, Denver, CO, March 2014
(2) World Congress of Molecular and Cell Biology, Dalian, China, April 2014
(3) Workshop on Percolation and the Glass Transition, Tel-Aviv, Israel, October 2014
(4) Physics Colloquium, Rochester Institute of Technology, November 2013
(5) Physics Colloquium, Binghamton University, September 2011
(6) Condensed Matter Seminar, Brandeis University, February 2011
(7) Condensed Matter Seminar, Boston University, February 2011
(8) Condensed Matter Seminar, Brown University, December 2010
(9) Physics Seminar, Rochester Polytechnic Institute, December 2010
(10) Mathematical Biology Seminar, UC-Davis, December 2010
(11) The Cellular Cytoskeleton Workshop, Colorado State University, June 2010
(12) Condensed Matter Seminar, University of Pennsylvania, March 2010
(13) Physics Colloquium, California Polytechnical Institute, March 2010
(14) Physics and Applied Math Seminar, University of California, Merced, March 2010
(15) Condensed Matter Seminar, Cornell University, January 2009
(16) Physics Colloquium, LeHigh University, October 2008
(17) 10th Annual Symposium of the Japanese-American Frontiers of Science, Shonan Village, Kanagawa, Japan, December 2007
(18) Physics Colloquium, Ithaca College, October 2007
(19) Physics Colloquium, Rochester Institute of Technology, October 2007
(20) Condensed Matter Seminar, University of Massachusetts, March 2007
(21) Condensed Matter Seminar, Cornell University, November 2006
(22) Dynamic Days, Bethesda, Maryland, January 2006
(23) New York Complex Matter Workshop, Syracuse University, December 2005
(24) APS March Meeting, March 2005
(25) Physics Colloquium, Northwestern University, March 2005
(26) Physics Colloquium, Syracuse University, March 2005
(27) Physics Colloquium, University of Washington-St. Louis, February 2005
(28) Physics Colloquium, Washington State University, February 2005
(29) Condensed Matter Seminar, Brandeis University, November 2004
(30) Condensed Matter Seminar, University of Pennsylvania, October 2004
(31) The Statistical Physics of Complex Systems, LANL Workshop, August, 2004
(32) Condensed Matter Physics Seminar, University of Rochester, April 2003
(33) Condensed Matter Seminar, Syracuse University, October 2001

Invited Workshops/Conferences

(1) Physics of Functional Biological Assemblies, Aspen Center for Physics, June 2013
(2) Soft Matter Gordon Research Conference, August 2013
(3) Complexity, Disorder, and Algorithms, Aspen Center for Physics, May-June 2008
(4) Dynamical Heterogeneities in Glasses and Granular Systems, Lorentz Institute, Leiden, Netherlands, September 2008
(5) Cytoskeletal Assembly and Cellular Motility, Aspen Center for Physics, June 2007

Public Lectures

(1) Expanding your Horizons: Career Workshop for Girls, Syracuse, November 2011
(2) Sonya Kovalevsky Festival, Syracuse, November 2009
(3) Frontiers of Science Lecture Series, Syracuse, March 2009
(4) Syracuse Cafe Scientifique, April 2008
(5) Science Today Series, SUNY Oswego, February 2008
(6) Museum of Science and Technology, Syracuse, several lectures during 2006-2007
(7) Saturday Morning Physics, Syracuse University, December 2007

Workshop Organizer

(1) ICAM Workshop: Soft Active Materials: From Granular Rods to Flocks, Cells and Tissues, May 2010, Organizers: Aparna Baskaran, Jay Henderson, Cristina Marchetti, Jen Schwarz, Roy Welch.

(2) Aspen Center for Physics Summer Workshop: Filamentous Assemblies: Complex Ordering from Biopolymers to Nano-rods, August-September 2010, Organizers: Robijn Bruinsma, Greg Grason, Jen Schwarz.

(3) The biannual New York Complex Matter Workshop, Organizers: Mark Bowick, M. Cristina Marchetti, Jen Schwarz, Itai Cohen, Abe Stroock, George Thurston; 2005-2011.

Postdoctoral Researchers Supervised

(1) Monwhea Jeng, 2006-2008, now at Microsoft
(2) Silke Henkes, 2010-2012, now faculty at the University of Aberdeen in the UK

Graduate Students Supervised

(1) Shiliyang Xu, 2007-2011, now a post-doc at the National Institutes of Health
(2) David Quint, 2007-2011, now a post-doc at the University of California-Merced
(3) Liang Cao, 2008-2012, now a quantitative analyst at Chatham Financial
(4) Jorge Lopez, 2011-present
(5) Tao Zhang, 2011-present
(6) David Mayett, 2012-present

Undergraduate Student Supervised

(1) Bismayan Chakrabarti, Summer 2009 (Undergraduate at IIT, Kanpur and now a physics graduate student at Rutgers University)

Manuscript Referee

(1) Physical Review Letters
(2) Physical Review E
(3) Journal of Mathematical Physics
(4) European Physics Letters
(5) Biophysical Journal

Grant Proposal Reviewer

(1) National Science Foundation, Condensed Matter and Materials Theory
(2) National Science Foundation, Panel Review for CBET, Multiphase and Particulate Matter