

## Monwhea Jeng Curriculum Vitae

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### Campus Address

Department of Physics  
Syracuse University  
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(web page contains applets and descriptions  
of current research)

### Background

- 7/2006-present: Syracuse University (Syracuse, NY)  
Research Associate
- 8/2002-5/2006: Southern Illinois University Edwardsville (Edwardsville, IL)  
Assistant Professor of Physics
- 9/1995-6/2002: University of California, Santa Barbara (Santa Barbara, CA) (GPA 3.95)  
Ph.D. in Physics (6/2002)  
Dissertation title: "Disorder and Interactions in Low-Dimensional Systems"  
Dissertation advisor: Andreas W. W. Ludwig  
Master of Arts in Physics (6/1998)
- 9/1991-6/1995: California Institute of Technology (Pasadena, CA) (GPA 4.0)  
Bachelor of Science with Honors in Mathematics and Astronomy (6/1995)

### Publications

1. "Comments on solving the fractional Schrödinger equation," M. Jeng and J. M. Schwarz, in preparation.
2. "On the study of force-balance percolation," M. Jeng and J. M. Schwarz, submitted to Phys. Rev. E.
3. "Vacancy diffusion in a triangular lattice dimer model," M. Jeng, M. Bowick, W. Krauth, J. M. Schwarz, and X. Xing, to appear in Phys. Rev. E. arXiv:0801.4718.
4. "On the study of jamming percolation," M. Jeng, and J. M. Schwarz J. Stat. Phys. **131**, 575 (2008). arXiv:0708.0582.
5. "Vacancy localization in the square dimer model," J. Bouttier, M. Bowick, E. Guitter, and M. Jeng, Phys. Rev. E **76**, 041140 (2007). arXiv:0706.1016.
6. "Comment on 'Jamming Percolation and Glass Transitions in Lattice Models,'" M. Jeng and J. Schwarz, Phys. Rev. Lett. **98**, 129601 (2007). cond-mat/0612484.
7. "Height variables in the Abelian sandpile model: scaling fields and correlations," M. Jeng, G. Piroux, and P. Ruelle, Journal of Statistical Mechanics: Theory and Experiment, P10015 (2006). cond-mat/0609284.

("Publications" continued on next page)

**Publications (continued)**

8. "Error in statistical tests of error in statistical tests," M. Jeng, BMC Medical Research Methodology 2006, **6**:45. (Discussed in Nature News: Nature **443**, 379 (2006).)
9. "Comparison of teaching methods for energy conservation," M. L. Horner, M. Jeng, and R. Lindell, 2006 Physics Education Research Conference (AIP Conf. Proceedings **883**, 161 (2006)), editors L. McCullough, L. Hsu, and P. Heron. (refereed proceedings).
10. "Bandwagon effects in particle physics," M. Jeng, Nuclear Instruments and Methods in Physics Research A **571**, 704 (2007).
11. "A selected history of expectation bias in physics," M. Jeng, Am. J. Phys. **74**, 578 (2006). physics/0508199.
12. "The Mpemba effect: When can hot water freezes faster than cold?," M. Jeng, Am. J. Phys. **74**, 514 (2006). physics/0512262.
13. "Conformal field theory correlations in the Abelian sandpile model," M. Jeng, Phys. Rev. E **71**, 016140 (2005). cond-mat/0407115.
14. "The four height variables, boundary correlations, and dissipative defects in the Abelian sandpile model," M. Jeng, Phys. Rev. E **71**, 036153 (2005). cond-mat/0405594.
15. "The four height variables of the Abelian sandpile model," M. Jeng. cond-mat/0312656.
16. "Boundary conditions and defect lines in the Abelian sandpile model," M. Jeng, Phys. Rev. E **69**, 051302 (2004). cond-mat/0310605.
17. "Limits on finite-time thermal heating efficiencies and rates," M. Jeng, Eur. J.Phys. **25**, 453 (2004).
18. "Interaction effects on quasiparticle localization in dirty superconductors," M.Jeng, A. W.W. Ludwig, T. Senthil, and C. Chamon, Bull. Am. Phys. Soc. **46**, 231 (2001). cond-mat/0112044.
19. "Random defect lines in conformal minimal models," M. Jeng and A. W. W. Ludwig, Nucl. Phys. B **594**, 685 (2001). cond-mat/9910181.
20. "Random walks and effective resistances on toroidal and cylindrical grids," M. Jeng, Am. J. Phys. **68**, 37 (2000). physics/0405135.
21. "Rods near curved surfaces and in curved boxes," K. Yaman, M. Jeng, P. Pincus, C. Jeppesen, and C. M. Marques, Physica A **247**, 159 (1997). cond-mat/9706005.
22. "Electron screening in molecular fusion reactions," T. D. Shoppa, M. Jeng, S. E. Koonin, K. Langanke, and R. Seki, Nucl. Phys. A **605**, 387 (1996). nucl-th/9512041.
23. "Billiards in the  $\ell^p$  unit balls of the plane," M. Jeng and O. Knill, Chaos, Solitons and Fractals **7**, 543 (1996).

**Popular magazines/Internet FAQs**

1. "L'eau chaude gele-t-elle plus ite que l'eau froide?" ("Can hot water freezefaster than cold?,") La Recherche, November 2007, 413, p.62.
2. "Hot water freezes faster than cold!," sci.physics FAQ, [http://math.ucr.edu/home/baez/physics/General/hot\\_water.html](http://math.ucr.edu/home/baez/physics/General/hot_water.html)
3. "Does antimatter fall up or down?," sci.physics FAQ, <http://math.ucr.edu/home/baez/physics/ParticleAndNuclear/antimatterfall.html>

### **Grants**

1. "Exploring the Known: Expectation Bias in Physics," Summer Research Fellowship for \$8000, 2006 summer term. (Funded, but turned down by myself due to job change.)
2. "Models of Complexity: Logarithmic Correlations in the Abelian Sandpile Model," Summer Research Fellowship for \$6000, 2005 summer term.
3. "The Effects of Boundary Conditions and Human Design in Models of Complexity," Summer Research Fellowship for \$6000, 2003 summer term.

### **Reviewing Activities**

Europhysics Letters  
Journal of Physics A  
Journal of Statistical Mechanics: Theory and Experiment  
Nuclear Physics B  
Physics Letters A

### **Awards and Fellowships**

6/1996: David S. Saxon Award for Academic Excellence (UC Santa Barbara)  
9/1995-6/1996 and 9/1998-6/1999: UC Regents Fellowship (two years) (UC Santa Barbara)  
5/1995: Sigma Xi Science Research Society Award  
9/1994-6/1995: Carnation Fellowship (California Institute of Technology)

### **Computer Languages and Experience**

Computer languages: C/C++, Java, Mathematica, gawk, html/xhtml, Python, Fortran, Pascal  
Experience using: Unix, LaTeX, Windows XP, MS Office, OpenOffice

### **Professional Affiliations**

12/2000-12/2001, 12/2006-present: Member. American Physical Society

## **Teaching Experience**

8/2002-5/2006: Assistant Professor (Edwardsville, IL)  
Southern Illinois University Edwardsville

### Undergraduate Classes

Conceptual Physics. Typically 70 students (Phys 111) --- 5 times

Conceptual Physics Laboratory. (Phys 112) --- 2 times

University Physics: Mechanics; calculus-based. Typically 60 students.  
(Phys 211A) --- 3 times

University Physics: Waves, Electricity, Magnetism; calculus-based.  
Typically 50 students. (Phys 211B) --- 3 times

University Physics Lab: Mechanics; calculus-based. (Phys 212A) --- 4 times

University Physics Lab: Waves, Electricity, Magnetism; calculus-based.  
(Phys 212B) --- 5 times

### Graduate Classes

Computational Methods in Classical Mechanics (Phys 511) --- 1 time

Computational Methods in Electrodynamics (Phys 512) --- 2 times

Quantum Mechanics (Phys 513) --- 2 times

Independent studies with graduate students (see below) --- 4 times

### Senior Projects with undergraduates

Sandpile simulations

### Independent Studies with Graduate Students

Classical mechanics and thermal physics

Condensed matter physics

Solid-state physics

Thermal physics

9/1996-6/1998, 9/1999-8/2000: Teaching Assistant (Santa Barbara, CA)  
University of California, Santa Barbara

Introductory Physics (calculus-based)

Introductory Physics Laboratory (algebra-based)

Graduate Condensed Matter

Graduate Electromagnetism

Graduate Quantum Many-body

Graduate Statistical Mechanics

6/1999-8/1999, 4/2000-6/2000: Grader (Santa Barbara, CA)  
University of California, Santa Barbara

Differential Equations

Electromagnetism

**Service: Committees**

Unless otherwise stated, committee work occurred at Southern Illinois University Edwardsville (SIUE).

- 9/2004-5/2006: Undergraduate Programs Committee  
Reviewed proposals for changes to department programs at SIUE.
- 8/2003-5/2006: Physics Department Recruitment Committee  
(Chair from 8/2003-5/2004)  
Wrote, rewrote, designed, and distributed recruitment materials. Participated in recruitment events. Ran mass mailings to companies and schools for recruitment of undergraduate and graduate students. Collected statistics related to recruitment issues.
- 8/2003-5/2006: Physics Department Shaw Lecture Committee  
(Chair from 8/2003-5/2004)  
Organized events for Shaw memorial lecture (e.g. reception, lunch, publicity, etc. . .)
- 8/2003-5/2005: Physics Department Proficiency Committee  
(Chair from 8/2004-5/2005)
- 8/2003-5/2004: Chair of Physics Department Undergraduate Advisory Committee.  
Designed new policy for Advanced Placement exams. Rewrote guidelines for undergraduate physics awards, and reviewed nominees for awards. Ruled on undergraduate petitions.
- 8/2002-5/2006: SM Cluster (subcommittee of the Academic Computing Council).  
Collected, submitted, and discussed department requests for computer equipment.
- 8/2002-8/2003, 5/2005-5/2006:  
Physics Department Masters Qualifying Exam Committee  
(Chair during summer session: 5/2003-8/2003)  
Wrote and graded Masters qualifying exam.
- 8/2002-5/2003: Physics Department Undergraduate Curriculum Committee  
Dealt with new course approval, changes in course design, prerequisite approval, textbook choices, and other issues with undergraduate curriculum.
- 9/1994-6/1995: Undergraduate member on the California Institute of Technology faculty-student Curriculum Committee (Pasadena, CA).
- 9/1994-6/1995: Undergraduate alternate member on the California Institute of Technology faculty-student Academic Policies Committee (Pasadena, CA).

(See next page for service activities not on committees)

### **Other Service Activities / Other Educational Experience**

Unless otherwise stated, service activities and education experiences took place in Edwardsville, IL. SIUE stands for “Southern Illinois University Edwardsville.”

- 4/2006: SLAPT (Saint Louis Area Physics Teacher) Physics Contest.  
 4/2006: Judge at Science Fair at Francis Cabrini Academy (Saint Louis, MO)  
 3/2006: Judge in Regional Science Fair at SIUE, two days. Regular judging and special awards judging.  
 2/2006: Science Olympiad, “Circuit Lab.” Designed and judged challenge for students.  
 11/2005: “Ask a Physicist” for Physics Day: World Year of Physics, 2005.  
 11/2005: SIUE Preview Day.  
 3/2005: Judge in Regional Science Fair at SIUE, two days. Regular judging and special awards judging.  
 2/2005: Science Olympiad, “Practical Data Gathering.” Designed and judged challenge for students.  
 10/2004: “Not-So-Haunted Halloween Laboratory,” at the Children's Museum in Edwardsville, IL.  
 10/2004: SIUE Preview Day.  
 8/2004: Freshman orientation. Introduction to the physics department.  
 3/2004: Judge in Regional Science Fair at SIUE, two days. Regular judging and special awards judging.  
 3/2004: Judge in Science Fair at St. Francis Cabrini Academy (Saint Louis, MO).  
 2/2004: Science Olympiad, “Practical Data Gathering.” Designed and judged challenge for students.  
 10/2003: “Not-So-Haunted Halloween Laboratory,” at the Children's Museum in Edwardsville, IL.  
 10/2003: SIUE Preview Day.  
 3/2003: Judge in Regional Science Fair at SIUE.  
 3/2003: Judge in Science Fair at Notre Dame Elementary School (Saint Louis, MO).  
 2/2003: Science Olympiad. Designed “Compute This!” challenge for students. Judged “Mission Possible” challenge.  
 10/2002: “Not-So-Haunted Halloween Laboratory,” at the Children's Museum in Edwardsville, IL.  
 4/2002: Judge in Santa Barbara Science Fair.  
 4/2001-6/2002: Physics Circus, a physics outreach program consisting of interactive physics demonstrations for K-6 students (Santa Barbara, CA).  
 11/2000-12/2000: Visiting Student Researcher at the University of Amsterdam (Amsterdam, Netherlands).

(“Other service activities/Other educational experience” continued on next page)

**Other Service Activities / Other Educational Experience (continued)**

- 7/2000-8/2000: Temporary Volunteer Coordinator. Part-time position at Transition House, a Santa Barbara homeless shelter (Santa Barbara, CA).
- 12/1998-6/2002: Volunteer. 4 hours/week at Transition House, a Santa Barbara homeless shelter. Duties included tutoring K-8 students, and assisting in arts and crafts programs for children of various ages (Santa Barbara, CA).
- 9/1998-9/2000: Tutor for introductory physics classes (Santa Barbara, CA).
- 1/1998-3/1998: Solution Writer. Contract job for the publishers of the 4<sup>th</sup> edition of Tipler's "Physics for Scientists and Engineers," writing solutions (company in New York City, NY).

**Presentations**

- 12/2007: "Vacancy Diffusion in the Triangular Lattice Dimer Model," Fifth New York Complex Matter Workshop, Syracuse University, Syracuse, NY.
- 6/2007: "Weak Localization in the Square Dimer Model," poster presentation at Gordon Research Conference on Nonlinear Science, Colby College, Waterville, ME.
- 6/2007: "Weak Localization in the Square Dimer Model," Fourth New York Complex Matter Workshop, Cornell University, Ithaca, NY.
- 3/2007: "Correlated Percolation Models of Jamming and Glass Transitions," March Meeting of the American Physical Society. Denver, CO.
- 12/2006: "Quantum Percolation on Correlated and Uncorrelated Lattices," Third New York Complex Matter Workshop, Syracuse University, Syracuse, NY.
- 3/2006: "The Sandpile Model as a Logarithmic Conformal Field Theory," Syracuse University, Syracuse, NY.
- 11/2005: "Bandwagon Effects in Particle Physics," Southern Illinois University Edwardsville, Edwardsville, IL.
- 4/2005: "Bell's Theorem, Nonlocality, and Unbreakable Codes," Southern Illinois University Edwardsville, Edwardsville, IL.
- 3/2002: "Scaling, Universality, and Self-Similarity in Disordered Systems," California State Polytechnic Institute in Pomona, Pomona, CA.
- 3/2002: "Scaling, Universality, and Self-Similarity in Disordered Systems," University of Wisconsin Eau Claire, Eau Claire, WI.
- 2/2002: "Scaling, Universality, and Self-Similarity in Disordered Systems," College of Wooster, Wooster, OH.
- 2/2002: "Scaling, Universality, and Self-Similarity in Disordered Systems," Southern Illinois University Edwardsville, Edwardsville, IL.
- 2/2002: "Scaling, Universality, and Self-Similarity in Disordered Systems," King's College, Wilkes-Barre, PA.
- 7/2001: "Interaction Effects on Quasiparticle Localization in Dirty Superconductors," poster presentation at the International Center for Theoretical Physics in Trieste, Summer School on Low-Dimensional Quantum Systems. Trieste, Italy.
- 3/2001: "Interaction Effects on Quasiparticle Localization in Dirty Superconductors," March Meeting of the American Physical Society. Seattle, WA.

## **References**

References available upon request.