Matthew Wittmann

PhD Candidate in Physics

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Education

since 2009 — PhD in Physics (expected 9/2015). *University of California, Santa Cruz.*
Supervised by Dr. A. Peter Young (see Research Experience).

2009–2011 — MS in Physics. *University of California, Santa Cruz.*
"Spin glasses in the nonextensive regime", supervised by Dr. A. Peter Young.

2005–2009 — BA in Physics and Mathematics. *University of Colorado, Boulder.*
Summa Cum Laude with minor in Computer Science, 3.8 GPA.
Undergraduate thesis supervised by Dr. John Price.

Workshops & Short Courses

6/2013 — Beg Rohu School of Statistical Physics and Condensed Matter. *Quiberon, France.*
Two-week course with special focus on disordered systems.

9/2012 — Efficient Algorithms in Computational Physics. *Bad Honnef, Germany.*
Two-week course focusing on Monte Carlo techniques. I assisted students with homework problems during the data analysis portion of the course, taught by my PhD advisor.

Research Experience

since 2010 — Graduate Student Researcher. *University of California, Santa Cruz.*
With supervisor Dr. A. Peter Young, I have studied topics in statistical and computational physics including spin glasses [2, 3, 6], finite-size scaling in high-dimensional systems [1], quantum algorithms [4, 5], and optimization problems [5].

2014 — Guest Researcher. *Max Planck Institute for the Physics of Complex Systems, Dresden, Germany.*
I studied finite-size scaling in high-dimensional systems and the dynamics of disordered systems using large-scale Monte Carlo simulations.

2008–2009 — Undergraduate Researcher. *University of Colorado, Boulder.*
Supervised by Dr. John Price, I characterized acoustic resonators and developed MATLAB code to extend the capabilities of AcousticVNA, a system for acoustic vector network analysis.

Teaching & Outreach

2014 — Juror at USA Young Physicists Tournament. *San Jose, CA.*

Judge at Pacific Collegiate School Science Fair. *Santa Cruz, CA.*

2009–2011 — TA in Physics and Mathematics. *University of California, Santa Cruz.*
Taught lower- and upper-division physics lab courses and led discussion sections in lower-division math and upper-division physics lecture courses.

2008–2009 — Instructor Assistant in Mathematics. *University of Colorado, Boulder.*
Led tutorials in supplemental math courses at the precalculus level.

Skills & Expertise

Modeling/ Optimization	Monte Carlo simulation, statistics, stochastic optimization, nonlinear fitting, numerical linear algebra, error analysis
Math/ Physics	disordered systems, statistical physics, quantum mechanics, quantum algorithms, graph theory, satisfiability
Proficient	Python/NumPy, pandas, C/C++, MATLAB, Mathematica, Git, Bash, LaTeX, HTML/CSS
Familiar	scikit-learn, R, SQL, JavaScript, Java
Hobbies	cycling, hiking, backpacking, music

Publications

[1] Matthew Wittmann and A. P. Young. "Finite-size scaling above the upper critical dimension". In: *Phys. Rev. E* 90 (6 Dec. 2014), p. 062137.

[2] Matthew Wittmann et al. "Low-temperature behavior of the statistics of the overlap distribution in Ising spin-glass models". In: *Phys. Rev. B* 90 (13 Oct. 2014), p. 134419.

[3] Matthew Wittmann and A. P. Young. "Spin glasses in the nonextensive regime". In: *Phys. Rev. E* 85 (4 Apr. 2012), p. 041104.

Conferences

[4] Matthew Wittmann, Itay Hen, and A. P. Young. "Distinguishing graphs with a quantum annealer using susceptibility measurements". Talk given at APS March Meeting. 2014.

[5] Matthew Wittmann, Itay Hen, and A. P. Young. "Scheduling: a good candidate for quantum annealing?" Poster presented at Berkeley Mini Statistical Mechanics Meeting. 2014.

[6] Matthew Wittmann et al. "Low-temperature behavior of the spin overlap distribution in one-dimensional long-range diluted spin glasses". Talk given at APS March Meeting. 2013.