



# Matthew Wittmann

*Ph.D. Candidate in Physics*

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## Education

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- 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.  
Research in acoustic vector network analysis 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

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- 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 [1–3], finite-size scaling in high-dimensional systems [4], quantum algorithms [5, 6], and optimization problems [6].
- 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 computer simulations.
- 2008–2009 Undergraduate Researcher. *University of Colorado, Boulder.*  
Supervised by Dr. John Price, I characterized acoustic resonators and worked on extending the capabilities of an existing acoustic reflectometry system to allow complete scattering matrix measurements.

## Teaching & Outreach

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- 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

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

## Publications & Conference Presentations

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- [1] Matthew Wittmann and A. P. Young. "Spin glasses in the nonextensive regime". In: *Phys. Rev. E* 85 (4 Apr. 2012), p. 041104.
- [2] 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.
- [3] 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.
- [4] Matthew Wittmann and A. P. Young. "Finite-size scaling above the upper critical dimension". In: *Phys. Rev. E* 90 (6 Dec. 2014), p. 062137.
- [5] Matthew Wittmann, Itay Hen, and A. P. Young. "Distinguishing graphs with a quantum annealer using susceptibility measurements". Talk given at APS March Meeting. 2014.
- [6] Matthew Wittmann, Itay Hen, and A. P. Young. "Scheduling: a good candidate for quantum annealing?" Poster presented at Berkeley Mini Statistical Mechanics Meeting. 2014.