

# Edwin Miles Stoudenmire

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## Research Experience

- 2010-Pres. Postdoctoral Researcher, UC Irvine  
Supervisors: Steven R. White and Kieron Burke
- Performed state of the art simulations of model electronic structure systems, frustrated magnets, and topologically ordered nanowires.
  - Co-developed an open source library for tensor product wavefunction algorithms. Website: <http://itensor.org/>
- 2005-2010 Graduate Research Assistant, UC Santa Barbara  
Supervisor: Leon Balents
- Applied a variety of analytical methods (bosonization, mean-field theory, spin wave calculations, high temperature series) to study frustrated magnets
  - Developed code based on the [ALPS](#) simulation library to implement a novel semi-classical algorithm for finite temperature quantum magnets
  - Collaborated with Steven R. White on a new method for simulating finite temperature quantum systems ([METTS](#) algorithm).

## Education

- 2010 PhD in Physics, UC Santa Barbara. Advisor: Leon Balents  
2005 BS in Physics, Georgia Institute of Technology, highest honors  
2005 BS in Mathematics, Georgia Institute of Technology, highest honors

## Publications

- 2012 **E.M. Stoudenmire**, Lucas O. Wagner, Steven R. White and Kieron Burke, “One-dimensional continuum electronic structure with the density matrix renormalization group and its implications for density functional theory”, *Phys. Rev. Lett.* **109**: [056402](#)
- 2012 Lucas O. Wagner, **E.M. Stoudenmire**, Kieron Burke and Steven R. White, “Reference electronic structure calculations in one dimension”, *Phys. Chem. Chem. Phys.* **14**: [8581](#)
- 2012 **E.M. Stoudenmire** and Steven R. White, “Studying two dimensional systems with the density matrix renormalization group”, *Annual Reviews of Condensed Matter Physics* **3**: [111](#)

- 2011 **E.M. Stoudenmire**, Jason Alicea, Oleg A. Starykh and Matthew P.A. Fisher, “Interaction effects in topological superconducting wires supporting majorana fermions”, *Phys. Rev. B* **84**: [014503](#) [Editor’s suggestion, [Synopsis Article](#)]
- 2010 **E.M. Stoudenmire** and Steven R. White, “Minimally entangled typical thermal state algorithms” *New J. Phys.* **12**: [055026](#)
- 2009 **E.M. Stoudenmire**, Simon Trebst and Leon Balents, “Quadrupolar correlations and spin freezing in S=1 triangular lattice antiferromagnets”, *Phys. Rev. B* **79**: [214436](#)
- 2008 **E.M. Stoudenmire** and Leon Balents, “Ordered phases of the anisotropic kagome lattice antiferromagnet in a field”, *Phys. Rev. B* **77**: [174414](#)
- 2005 **E.M. Stoudenmire** and C.A.R. Sá de Melo, “Magnetoresistive effects in ferromagnet-superconductor multilayers”, *J. Appl. Phys.* **97**: [10J108](#)

## Invited Talks

- Dec 2012 National Taiwan University, Winter School: DMRG 101. Taipei, Taiwan.
- May 2012 UC Merced Dept. of Chemistry, “*Exact Electronic Structure in 1d*”. Merced, CA.
- Mar 2012 IMSC Chennai, K.S. Krishnan Meeting on Tensor Network States  
“*From DMRG to Tensor Network States*” (2 Lectures, Delivered Online). Chennai, India.
- Mar 2012 APS March Meeting, Symposium on DFT, “*Exact Density Functional Calculations with DMRG*”. Boston, MA.
- Jun 2011 Microsoft Station Q Seminar, “*Interaction Effects in Topological Superconducting Wires*”. Santa Barbara, CA.
- Oct 2010 L.A. Cond. Mat. Theory Meeting, “*DMRG Meets DFT*”. Pasadena, CA.

## Teaching Experience

- 2012 Substitute Lecturer, UCI advanced undergraduate quantum mechanics (2 Lectures)
- 2008 Substitute Lecturer, UCSB graduate condensed matter physics (4 Lectures)
- 2005-2009 Teaching Assistant, UCSB graduate courses in many-body methods, condensed matter physics and advanced statistical mechanics
- 2004-2005 Kaplan SAT Instructor
- 2002-2005 Teaching Assistant, Georgia Tech undergraduate mathematics courses (taught weekly recitation sections for three years)

## Selected Activities

Jul 2010	Boulder Summer School in Condensed Matter Physics, <i>Computational Methods</i> . Boulder, CO.
Dec 2009	ICTS Winter School on Condensed Matter Physics. Mahabaleshwar, India.
Mar 2009	IACS Conference on Recent Trends in Strongly Correlated Systems. Kolkata, India.
Jan 2009	IPAM Workshop on Numerical Approaches to Quantum Many-Body Systems. UCLA.
Jul 2008	Boulder Summer School in Condensed Matter Physics, <i>Strongly Correlated Materials</i> . Boulder, CO.
Aug 2007	Abdus Salam ICTP School and Workshop on Highly Frustrated Magnets. Trieste, Italy.
2007-2010	Seminar organizer, UCSB Condensed Matter Theory Group

## References

Prof. Steven R. White ([srwhite@uci.edu](mailto:srwhite@uci.edu))  
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