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Research Experience

- 2010-Pres. Postdoctoral Researcher, UC Irvine
Supervisors: Steven R. White and Kieron Burke
- Discovered a method for parallelizing the density matrix renormalization group (DMRG) algorithm in real space.
 - Performed state of the art simulations of model continuum electronic 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** and Steven R. White, "Real-space parallel density matrix renormalization group" *[in preparation]*
- 2012 Salvatore R. Manmana, **E.M. Stoudenmire**, Kaden R.A. Hazzard, Ana Maria Rey and Alexey V. Gorshkov, "Topological phases in polar-molecule quantum magnets" arxiv:[1210.5518](#)
- 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 (*Upcoming*) National Taiwan University, Winter School: DMRG 101. Taipei, Taiwan.
- Sep 2012 LMU München, “*Parallelizing DMRG in Real Space*”. Munich, Germany.
- Sep 2012 ITP Univ. of Cologne, “*New Tools for Simulating Realistic Systems with DMRG*”. Cologne, Germany.
- Aug 2012 JILA and CU Dept. of Physics, “*Simulating Realistic Systems with DMRG*”. Boulder, CO.
- 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).

- 2011-12 Private Physics Tutor. Graduate courses in electromagnetism (Jackson), classical mechanics (Goldstein) and quantum mechanics (Baym).
- 2008 Substitute Lecturer. UCSB graduate condensed matter physics (4 Lectures).
- 2005-2009 Teaching Assistant. UCSB graduate courses in quantum many-body methods, condensed matter physics and advanced statistical mechanics.
- 2004-2005 Kaplan SAT Instructor. Atlanta, GA. Taught large groups of high school students from a wide range of socioeconomic backgrounds.
- 2002-2005 Teaching Assistant, Georgia Tech undergraduate mathematics courses
Taught weekly recitation sections for three years.

Selected Activities

- Sep 2012 Autumn School on Correlated Electrons: From Models to Materials.
Forschungszentrum Jülich, Germany.
- Jul 2010 Boulder Summer School in Condensed Matter Physics, *Computational Methods*.
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, *Strongly Correlated Materials*.
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)
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