Kenneth M. Rudinger

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Education

University of Wisconsin-Madison, Madison, WI Fall 2009 to Present MS in Physics, August 2011 PhD in Physics, May 2014 (expected) GPA: 3.95 / 4.0

University of Chicago, Chicago, IL Fall 2006 to Spring 2008 BA in Physics with honors, June 2008 GPA: 3.77 / 4.0; Major GPA: 3.94 / 4.0

Brandeis University, Waltham, MA Fall 2004 to Spring 2006 GPA: 3.83 / 4.0; Major GPA 3.79 / 4.0

Research

Research AssistantMay 2010 to PresentProfessor Robert JoyntUniversity of Wisconsin-MadisonQuantum computing algorithms. Quantum state estimation.Graph isomorphism for strongly reg-ular graphs. Quantum random walks.

Research AssistantJuly 2008 to June 2009Professor Zheng-Tian LuArgonne National LaboratoryExperimental atomic physics. Laser spectroscopy of argon-39. RF plasma optimization.

Research Assistant April 2007 to July 2008 Professor Dietrich Mueller University of Chicago Experimental astroparticle physics. Equipment testing of balloon-based cosmic ray experiment TRACER. Detector simulations.

Research AssistantSummer 2004Professor Michael CarpenterSUNY AlbanyNanoscale sensor physics. Optical properties of CdSe quantum dots. Quantum dot film casting.

Teaching Experience

Teaching Assistant, Physics 247, University of Wisconsin-Madison, Fall 2013 Teaching Assistant, Physics 202, University of Wisconsin-Madison, Spring 2010 Teaching Assistant, Physics 202, University of Wisconsin-Madison, Fall 2009

Private Physics Tutor, Fall 2009 to Present

Teaching Assistant, Fast-Paced High School Physics, Johns Hopkins University CTY Program, Loudonville, NY, Summer 2006

Published Work

K. Rudinger, J. K. Gamble, E. Bach, M. Friesen, R. Joynt, and S. N. Coppersmith, "Comparing algorithms for graph isomorphism using discrete- and continuous-time quantum random walks," J. Theor. and Comp. Nanoscience, 10, pp. 1653-1661 (2013)

A. Frees, J. K. Gamble, K. Rudinger, E. Bach, M. Friesen, R. Joynt, S. N. Coppersmith, "Power law scaling for the adiabatic algorithm for search engine ranking." Phys. Rev. A. 88, 032307, (2013)

K. Rudinger, J. K. Gamble, M. Wellons, E. Bach, M. Friesen, R. Joynt, and S. N. Coppersmith, "Noninteracting multiparticle quantum random walks applied to the graph isomorphism problem for strongly regular graphs," Phys. Rev. A 86, 022334, (2012)

W. Williams, Z.-T. Lu, K. Rudinger, C.-Y. Xu, R. Yokochi, and P. Mueller, "Spectroscopic study of the cycling transition $4s[3/2]_2-4p[5/2]_3$ at 811.8 nm in ³⁹Ar: Hyperfine structure and isotope shift," Phys. Rev. A 83, 012512 (2011)

K. Rudinger, Z.-T. Lu , and P. Mueller, "The role of carrier gases in the production of metastable argon atoms in a rf discharge," Rev. Sci. Instrum. 80, 036105 (2009)

Talks

"Using the graph isomorphism problem to probe differences between discrete- and continuous-time quantum random walks", American Physical Society March Meeting, 2013, Baltimore

"Multiparticle Quantum Walks and the Graph Isomorphism Problem," Condensed Matter Theory Seminar, University of Wisconsin-Madison, April 2012

"Multiparticle Quantum Walks and the Graph Isomorphism Problem," American Physical Society March Meeting, 2012, Boston

"Quantum Random Walks of Non-Interacting Bosons on Strongly Regular Graphs," American Physical Society March Meeting, 2011, Dallas

Posters

"Multiparticle Quantum Walks and the Graph Isomorphism Problem," August 2012, 2012 Quantum Computing, Quantum Algorithms, and Multi-Qubit Coherent Operations Program Review, Denver

"Quantum Random Walks and the Graph Isomorphism Problem," August 2011, 2011 Quantum Computing, Quantum Algorithms, and Multi-Qubit Coherent Operations Program Review, Denver

"Quantum Random Walks Applied to the Graph Isomorphism Problem," August 2010, 2010 Quantum Computing, Quantum Algorithms, and Multi-Qubit Coherent Operations Program Review, Cincinnati

"Laser Spectroscopy of Argon-39," November 2008, Midwestern Cold Atom Workshop, Argonne National Laboratory

Outreach and Advocacy

Wonders of Physics annual show. Cast member, 2011-2013. University of Wisconsin-Madison.

"Government shutdown threatens scientific research." Author. September 27, 2013. Milwaukee Journal Sentinel.

Guest on Wisconsin Public Radio's "Central Time." Discussed impact of government shutdown on scientific research. October 2, 2013.

Honors and Awards

University of Wisconsin-Madison Honored Instructor, 2013 John Hasbrouck Van Vleck Physics Award, 2012 Elected to Phi Beta Kappa, 2008 University of Chicago Dean's List, 2006-2008 Brandeis University Dean's List, 2004-2006

References

Professor Robert Joynt University of Wisconsin-Madison Physics Department rjjoynt@wisc.edu (608) 263-4169 (608) 263-3279

Professor Eric Bach University of Wisconsin-Madison Department of Computer Sciences bach@cs.wisc.edu (608) 262-7997

Dr. John Gamble Harry S. Truman Fellow Sandia National Laboratories jkgambl@sandia.gov (505) 284-9987

Additional references available upon request.