YUAN HUANG

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EDUCATION

- 2012-2017 University of Massachusetts, Amherst Ph.D. in Physics expected
  Thesis: **First-principles approaches for strongly correlated quantum magnets**
  Advisor: Boris Svistunov
- 2011-2016 University of Science and Technology of China Ph.D. in Physics
  Advisor: Youjin Deng
- 2007-2011 University of Science and Technology of China Bachelor in Physics

RESEARCH INTERESTS

My main interest is in the field of the strongly correlated quantum magnetism. My specialty is to employ the path-integral Monte Carlo method and diagrammatic Monte Carlo method to obtain numerical results with controlled accuracy.

RESEARCH EXPERIENCE

Doctoral Research **2012-2017**

Department of Physics, University of Massachusetts, Amherst

- examined the charge quantization of the trapping center at the superfluid-Mott insulator quantum criticality with worm algorithm quantum Monte Carlo method, found a novel quantum phase transition between different charged states
- developed a bold diagrammatic Monte Carlo code for frustrated spin systems, found a low temperature spin ice state in the pyrochlore Heisenberg antiferromagnets

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RESEARCH EXPERIENCE (CONTINUE)

- performed the flowgram study of the Heisenberg model with ring-exchange interaction and examined the deconfined critical theory in this model

Doctoral Research **2011-2016**

National Laboratory for Physical Sciences at the Microscale, University of Science and Technology of China

- collaborated in the study of antiferromagnetic q-state Potts model, performed cluster Monte Carlo simulations and found a novel entropy-driven phase transition at arbitrarily large q on a special family of lattices
- carried out an exact mapping between the generalized Baxter-Wu model and Ashkin-Teller model, obtained the phase diagram of the Ashkin-Teller model by cluster Monte Carlo simulations

PUBLICATION LIST

- **Yuan Huang**, Kun Chen, Youjin Deng, Boris Svistunov, Trapping Centers at the Superfluid-Mott-insulator Criticality: Transition between Charge-quantized States, submitted, [arXiv: 1608.02232v1] (2016).
- **Yuan Huang**, Kun Chen, Youjin Deng, Nikolay V. Prokof'ev, and Boris V. Svistunov, Spin-Ice State of the Quantum Heisenberg Antiferromagnet on the Pyrochlore Lattice, *Phys. Rev. Lett.* 116, 177203 (2016).
- Kun Chen, **Yuan Huang**, Youjin Deng, Anatoly B. Kuklov, Nikolay V. Prokof'ev, and Boris V. Svistunov, Deconfined Criticality Flow in the Heisenberg Model with Ring-Exchange Interactions, *Phys. Rev. Lett.* 110, 185701 (2013).
- **Yuan Huang**, Youjin Deng, Jasper L. Jacobsen, and Jesús Salas, The Hintermann-Merlini-Baxter-Wu and the Infinite-Coupling-Limit Ashkin-Teller Models, *Nucl. Phys. B* 868, 492 (2013).
- **Yuan Huang**, Kun Chen, Youjin Deng, Jasper L. Jacobsen, Roman Kotecký, Jesús Salas, Alan D. Sokal, and Jan M. Swart, Two-dimensional Potts antiferromagnets with a phase transition at arbitrarily large q, *Phys. Rev. E* 87, 012136 (2013).
- Youjin Deng, **Yuan Huang**, Jasper L. Jacobsen, Jesús Salas, and Alan D. Sokal, Finite-Temperature Phase Transition in a Class of Four-State Potts Antiferromagnets, *Phys. Rev. Lett.* 107, 150601 (2011).

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CONFERENCES ATTENDED

Oral presentations

- "Low-temperature Spin-Ice State of Quantum Heisenberg Magnets on Pyrochlore Lattice", **APS March meeting**, Baltimore, MD, 2016.
- "Diagrammatic Monte Carlo Study of the Frustrated Heisenberg Antiferromagnets on Pyrochlore lattice", **seminar at Wilczek Quantum Center**, Hangzhou, 2015.
- "Potts Antiferromagnet in Two Dimensions", **International Workshop on Critical Behavior in Lattice Models**, Beijing, 2013.
- "Relevance of Deconfined-Criticality Action in the Light of the J-Q Spin Model", **APS March meeting**, Baltimore, MD, 2013.

Poster presentations

- "Low-temperature Spin-Ice State of Quantum Heisenberg Magnets on Pyrochlore Lattice", **Multidisciplinary University Research Initiatives review meeting**, Chicago, IL, 2016.

HONORS AND AWARDS

- China National Scholarship for graduate students, 2013
- Special Scholarship of National Laboratory for Physical Sciences at the Microscale, 2011
- Outstanding Graduate of University of Science and Technology of China, 2011
- China National Scholarship for undergraduate students, 2010
- The first prize in USTC RoboGame Robotics Competition, 2009
- The First Grade Outstanding Student Scholarship in University of Science and Technology of China, 2009
- China National Scholarship for undergraduate students, 2008
- Outstanding Freshman Student Scholarship in University of Science and Technology of China, 2007

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TEACHING EXPERIENCE

- Teaching Assistant of the lab section of Introductory Physics I for 20 undergraduate students at University of Massachusetts, Amherst, 2013
- Teaching Assistant of the classical electrodynamics course at University of Science and Technology of China, 2011
- Tutor a graduate student on math methods in physics for one semester
- Supervise an undergraduate student's dissertation project on Monte Carlo simulations of Bose Hubbard model at University of Science and Technology of China

SKILLS

- Programming Languages: Fortran, C/C++, Python, Matlab and Mathematica
- Ability to work with several operating systems, including Linux/Unix, Windows, and MacOS
- Experience with the circuit design and programming in robotic development
- Others: PBS queueing system, version control system(git), bash shell, LaTeX