

CURRICULUM VITAE

Erhai Zhao

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Education

2005 Ph.D., Northwestern University, Evanston, IL, USA
1999 M.S. and B.S., Fudan University, Shanghai, China

Professional Appointments

2009-present Assistant Professor, George Mason University
2007-2009 Postdoc, University of Pittsburgh Advisor: W. Vincent Liu
2005-2007 Postdoc, University of Toronto Advisor: Arun Paramekanti
2000-2005 Research Assistant, Northwestern University Advisor: James A. Sauls

Publications

1. “Topological Phases of Dipolar Particles in Elongated Wannier Orbitals”, Kai Sun, Erhai Zhao, and W. Vincent Liu, *Phys. Rev. Lett.* 104, 165303 (2010).
2. “Analytic thermodynamics and thermometry of Gaudin-Yang Fermi gases”, Erhai Zhao, Xi-Wen Guan, W. Vincent Liu, M. T. Batchelor, Masaki Oshikawa, *Phys. Rev. Lett.* 103, 140404 (2009).
3. “Orbital order in Mott insulators of spinless p-band fermions”, Erhai Zhao and W. Vincent Liu, *Phys. Rev. Lett.* 100, 160403 (2008).
4. “Dynamics of spin transport in voltage-biased Josephson junctions”, Erhai Zhao and J. A. Sauls, *Phys. Rev. Lett.* 98, 206601 (2007).
5. “BCS-BEC crossover on the two-dimensional honeycomb lattice”, Erhai Zhao and Arun Paramekanti, *Phys. Rev. Lett.* 97, 230404 (2006).
6. “Excitations in correlated superfluids near a continuous transition into a supersolid”, Erhai Zhao and Arun Paramekanti, *Phys. Rev. Lett.* 96, 105303 (2006).
7. “Phase modulated thermal conductance of Josephson weak links”, Erhai Zhao, Tomas Löfwander and J. A. Sauls, *Phys. Rev. Lett.* 91, 077003 (2003).
8. “Effective action approach to the p-band Mott insulator and superfluid transition”, Xiaopeng Li, Erhai Zhao, and W. Vincent Liu, *Phys. Rev. A* 83, 063626 (2011).

9. “Modulated pair condensate of p-orbital ultracold fermions”,
Zixu Zhang, Hsiang-Hsuan Hung, Chiu Man Ho, Erhai Zhao, W. Vincent Liu,
Phys. Rev. A 82, 033610 (2010).
10. “Theory of quasi-one-dimensional imbalanced Fermi gases”,
Erhai Zhao and W. Vincent Liu, *Phys. Rev. A* 78, 063605 (2008).
11. “Microscopic simulation of superconductor/topological insulator proximity structures”,
Mahmoud Lababidi and Erhai Zhao, *Phys. Rev. B* 83, 184511 (2011).
12. “Mott scattering at the interface between a metal and a topological insulator”,
Erhai Zhao, Chun Zhang, and Mahmoud Lababidi, *Phys. Rev. B* 82, 205331 (2010).
13. “Liquid crystal phases of ultracold dipolar fermions on a lattice”,
Chungwei Lin, Erhai Zhao, and W. Vincent Liu, *Phys. Rev. B* 81, 045115 (2010).
14. “Differential conductance anomaly in superconducting quantum point contacts”,
Argo Nurbawono, Yuan Ping Feng, Erhai Zhao, and Chun Zhang,
Phys. Rev. B 80, 184516 (2009).
15. “Theory of nonequilibrium spin transport and spin transfer torque in superconducting-ferromagnetic nanostructures”,
Erhai Zhao and J. A. Sauls, *Phys. Rev. B* 78, 174511 (2008).
16. “Self-consistent slave rotor mean field theory for strongly correlated systems”,
Erhai Zhao and Arun Paramekanti, *Phys. Rev. B* 76, 195101 (2007).
17. “Temperature dependent Fermi arcs in the normal state of the underdoped cuprate superconductors”,
Arun Paramekanti and Erhai Zhao, *Phys. Rev. B* 75, 140507 (2007).
18. “Nonequilibrium superconductivity near spin active interfaces”,
Erhai Zhao, Tomas L’ofwander and J. A. Sauls, *Phys. Rev. B* 70, 134510 (2004).
19. “Heat transport through Josephson point contacts”,
Erhai Zhao, Tomas L’ofwander and J. A. Sauls, *Phys. Rev. B* 69, 134503 (2004).
20. “An effective field theory for one-dimensional polarized Fermi gases”,
Erhai Zhao and W. Vincent Liu, *J. Low Temp. Phys.* 158, 36 (2010).
21. “Temperature scaling of Fermi arcs in the normal state of the underdoped cuprate superconductors”,
Erhai Zhao and Arun Paramekanti, *Physica B: Condensed Matter* 403, 1104 (2008).
22. “Dynamical process of excitation fusion in polymers”,
E. Zhao, K. Chen, H. Jiang, X. Sun and T. F. George, *Journal of Chemical Information and Computer Sciences* 40, 542 (2000).
23. “The polarizability of exciton and biexciton in polymers”,
K. Chen, E. Zhao, X. Sun and R.-L. Fu, *Acta Physica Sinica* 49, 1778 (2000).

24. “The linear response of biexciton to external electrical field in polymers”,
E. Zhao, H. Jiang, C.-Q. Wu, X.-H. Xu and X. Sun, *Acta Physica Sinica* 48, 2110 (1999).
25. “The combination process of two excitons to one biexciton in polymers”,
E. Zhao, R.-T. Fu, X. Sun, R.-L. Fu, J.-H. Zhu, Z.-L. Zhang and X.-Y. Jiang, *Acta Physica Sinica* 47, 2031 (1998).

Invited Talks

- “Ultracold Fermi Gases in One and Quasi-one Dimension”,
Kavli Institute of Theoretical Physics, UC Santa Barbara, Oct. 2011.
- “Heterostructures of topological materials: simulating the interface”,
Computational Materials Science Center, George Mason University, Sept. 2010.
- “Spin flip at the interface between a metal and a topological insulator”,
National Institute of Standards and Technology, July. 2010.
- “Spin-transport and spin-transfer torque in SF nanostructures”,
Session H1, Charge and Spin Transport in Josephson and Proximity Devices, APS March meeting, Mar. 2010.
- “One-dimensional Fermi gas with spin imbalance”,
Center for Advanced Study, Tsinghua University, Oct. 2009.
- “Building a crystalline superfluid one tube at a time”,
Kavli Institute of Theoretical Physics China, Oct. 2009.
- “Orbital physics in the ultracold”,
Kavli Institute of Theoretical Physics China, Oct. 2009.
- “Crystalline superfluidity in ultracold Fermi gases”,
University of Cincinnati, Feb. 2009.
- “A Tale of Two Fluids at Ten Nano-Kelvin”,
George Mason University, Jan. 2009.
- “Crystalline superfluidity in quasi-one dimension”,
National Institute of Standards and Technology, Jan. 2009.
- “Spin transport in FS heterostructures — Teaching nanomagnets new tricks”,
University of Toronto, Apr. 2006.
- “Nonequilibrium transport in Josephson point contacts”,
Georgia Institute of Technology, Aug. 2004.

Conference Presentations

- American Physical Society March Meeting, Dallas, 2011.
“Spin active scattering at the interface between a metal and a topological insulator”

- American Physical Society March Meeting, Portland, 2010.
“Exact thermodynamics of the Gaudin-Yang Fermi gas”
- International Symposium on Quantum Fluids and Solids, Evanston, 2009.
“Theory of quasi-one dimensional imbalanced Fermi gases”
- American Physical Society March Meeting, Pittsburgh, 2009.
“Effective theory for weakly coupled one-dimensional imbalanced Fermi gas”
- American Physical Society March Meeting, New Orleans, 2008.
“Orbital ordering in an atomic Mott insulator of p-band fermions”
- American Physical Society March Meeting, Denver, 2007.
“BCS-BEC crossover on the two dimensional honeycomb lattice”
- Gordon Research Conference on Correlated Electron Systems, South Hadley, 2006.
“Rotons and vortices near a continuous superfluid-to-supersolid transition”
- Ultra-Low Temperature Physics Conference, Gainesville, 2005.
“Andreev’s ‘daemon’ - phase-sensitive control of heat through Josephson junctions”
- 24th International Conference on Low Temperature Physics, Orlando, 2005.
“Nonequilibrium spin-transfer torque in SFNFS junctions”
- American Physical Society March Meeting, Los Angeles, 2005.
“Spin current in voltage-biased SFS Josephson junctions”
- American Physical Society March Meeting, Indianapolis, 2002.
“Magnetic field effect on the fluctuation corrections to the sound attenuation in liquid ^3He ”

Synergistic Activities

- Guest researcher, National Institute of Standards and Technology, Atomic Physics Division.
- Chair of session *J: Ultra-Cold Atoms*, QFS 2009, International Symposium on Quantum Fluids and Solids.
- Member, Center for Quantum Science, George Mason University.
- Member, Computational Materials Science Center, George Mason University.