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Citizenship: Taiwan,(R.O.C.);
Residence: Permanent Residence(USA)
Marital status: Married
Language: English and Mandarin(bilingual)

Education

- Ph.D. Physics, The University of Texas at Austin. Dec. 2008
(Thesis Advisor: Allan H. MacDonald)
- M.S. Physics, National Central University(NCU), Taiwan. 1999
(Summa Cum Laude)
- B.S. Physics, National Central University, Taiwan. 1997
(Honored student: directly promoted to Master program at NCU)

Professional Employment

Los Alamos National Laboratory, Los Alamos, NM. 2012 - Present
Postdoctoral Research Associate of Theoretical Division (Mentor: Dr. Jian-Xin Zhu)

Georgetown University, Washington, DC. 2009 - 2012
Postdoctoral Fellow of Physics (Mentor: Prof. James K. Freericks)

University of Texas at Austin 2009
Postdoctoral Fellow of Physics (Mentors: Profs. Allan H. MacDonald and Greg Fiete)

Department of Physics, University of Texas at Austin 2002 - 2008
Graduate research and teaching assistant (Mentor: Prof. Allan H. MacDonald)

National Center for Theoretical Sciences, Hsinchu, Taiwan 2001 - 2002
Postgraduate Research Scholar

Current Research Interests

I am interested in quantum condensed matter and cold atom physics where interactions and wave function topology play an important roles. I have a strong record working independently and collaboratively. I embrace analytical and computational approaches. The topics I worked on include

- Condensed matter physics and cold atom physics
- Strongly correlated materials(including complex oxides and heavy-fermion materials)
- Quantum information and simulation realized in cold atom and solid state systems
- Topological phases and correlation effects
- Quantum dynamics and low temperature physics

Research Highlights

- Over **15** refereed publications and **453** citations(**435** since **2009**). H-index = **8** by Google Scholar.
- Papers published in top peer-reviewed journals such as **Nature(1)**, **Science(1)**, **Nature Communication(1)**, and **Physical Review Letter(1)**, **New Journal of Physics(1)**, **Physical Review A or B.(6)**, **Physical Review E.(1)**, and **Phys. Stat. Sol.(1)**.

- Key theorist for the first realized quantum Ising spin models with hundreds of spins for ultracold ions.(Nature 2012)
- Key theorist for the realization of spin liquid phases for ultracold ions.(Science 2013)

Teaching and Supervising Experience

- Co-supervisor for the visiting summer graduate student, Yuan-Yen Tai at Dr. Jianxin Zhu's group (2013).
- Co-supervisor for the summer REU undergraduate, Adam Keith, LeRoy Apker award finalist due to the work at Prof. Jim Freericks's group, Georgetown University, 2011
- Co-supervisor for graduate students, Dr. Jun Wen, Victor Chua, and Vladimir A. Zyuzin at Prof. Greg Fiete's group at University of Texas at Austin, 2009
- Substitute lecturer for Advanced Quantum Mechanics at Georgetown University(taught 2 lectures on laser cooling) 2011
- Substitute lecturer for the graduate course Quantum Mechanics at Georgetown University (taught 3 lectures on time-dependent theory for quantum mechanics) 2009
- Grader, PHY 303 K and PHY 303 L, University of Texas at Austin, 2002 (duties: office hours and grading)
- Teaching Assistant, Engineering Physics I and II, University of Texas at Austin, 2003–2006 (duties: discussion sessions, office hour, grading, and review sessions)
- Teaching Assistant, Physical Laboratory for PHY 301 , University of Texas at Austin, 2007 (duties: lecture, grading, and problem shooting in the Lab.)

Research Related Service

Journal reviewer for Scientific Report(Nature), Physical Review A and Physical Review B.

Honors and Awards

Professional Development Award, University of Texas at Austin (2008)

Recipient of Fellowship to attend Enrico Fermi summer school on cold atoms, Italy (2006)

Outstanding Research Fellowships from Education Ministry in Taiwan (1997–1999)

Honored undergraduate student to be accepted in the master program without the need of Joint Entrance Examination (only ten are admitted in Taiwan), National Central University

Fourth Prize winner for the competition for Physics Olympiad selection at National Wu-Ling senior high school(the bed for the international Physics Olympiad finalists in Taiwan at the time)

Affiliation

Members of American Physics Society(APS), affiliated with Division of condensed matter physics, Division of atomic, molecular and optical physics, Texas section and Four Corners section

Papers in Preparation

1. C.-C. Joseph Wang and Jian-Xin Zhu, "Local Electronic Structure around a Single Impurity in an Anderson Lattice Model for Topological Kondo Insulators", arXiv: arXiv:1402.6774 (2014)
2. Y.-Y. Tai, C.-C. Joseph Wang, Jianxin Zhu, M. Graf, and C. S. Ting, "Emergent topological phases in band insulators with crystal field split t_{2g} orbitals", arXiv:1403.1932 (2014)
3. C.-C. Joseph Wang and Jianxin Zhu, "Phonon renormalization of electronic properties in heavy-fermion materials and Kondo insulators ", in preparation (2013)

Peer Reviewed Publications

1. C.-C. Joseph Wang and Jian-Xin Zhu, "Fermi Surface Topology and De Hass-Van Alphen Orbits in PuIn_3 and PuSn_3 Compounds", **Phys. Rev. B** 88, 125106 (2013)
2. R. Islam et al., C.-C. J. Wang, J. K. Freericks, C. Monroe, "Emergence and Frustration of Magnetic Order with Variable-Range Interactions in a Trapped Ion Quantum Simulator", **Science** 340, 583 (2013)
3. C.-C. Joseph Wang, Adam Keith, J. K. Freericks, "Phonon Mediated Quantum Spin Simulator Employing a Planar Ionic Crystal in a Penning Trap", **Phys. Rev. A** 87, 013422 (2012)
4. C.-C. Joseph Wang, J. K. Freericks, "Intrinsic Phonon Effects on Analog Quantum Simulators with Ultracold Trapped Ions", **Phys. Rev. A** 86, 032329 (2012)
5. J. W. Britton, B. C. Sawyer, A. Keith, C.-C. Joseph Wang, J. K. Freericks, M. J. Biercuk, H. Uys, J. J. Bollinger, "Engineered 2D Ising Interactions on a Trapped-Ion Quantum Simulator with Hundreds of Ions", **Nature** 484, 489 (2012)
6. J. W. Britton, B. C. Sawyer, A. Keith, C.-C. Joseph Wang, J. K. Freericks, M. J. Biercuk, H. Uys, J. J. Bollinger, "Spectroscopy and Thermometry of Drumhead Modes in a Mesoscopic Trapped-Ion Crystal Using Entanglement", **Phys. Rev. Lett.** 108, 213003 (2012)
7. K. Kim et al., C.-C. Joseph Wang, J. K. Freericks, C. Monroe, "Quantum Simulation of the Transverse Ising model with Trapped Ions", Review article: **New J. Phys.** 13, 105003 (2011).
8. R. Islam et al., C.-C. Joseph Wang, J. K. Freericks, C. Monroe, "Onset of a Quantum Phase Transition with a Trapped Ion Quantum Simulator", **Nature Communication** 2, 377(2011)
9. Jun Wen, Andreas Ruegg, C.-C. Joseph Wang, and Gregory A. Fiete "Interaction-Driven Topological Insulators on the Kagome and the Decorated honeycomb lattices", **Phys. Rev. B** 82, 075125(2010)
10. C.-C. Joseph Wang, Rembert Duine, Allan H. MacDonald, "Quantum Vortex Dynamics in Two-Dimensional Neutral Superfluids", **Phys. Rev. A** 81, 013609 (2010)
11. C.-C. Joseph Wang, Bhagawan Sahu, Hongki Min, Wei-Cheng Lee, Allan H. MacDonald, "Quantum Wells in Polar-Nonpolar Oxide Hetero-junction Systems", **Phys. Rev. B** 79, 115408 (2009)
12. Cheng-Ching Wang and Pi-Gang Luan, "Effect of Dielectric Responses on Localization in 1D Random Periodic-On-Average Systems", **Phys. Rev. E** 65, 066602 (2002)
13. Cheng-Ching Wang and Zhen Ye, "Comparison of Models for Acoustic Resonant Scattering by a Spherical Air Bubble in Water", **Journal of Sound and Vibration** 250, 723-744 (2002).
14. Cheng-Ching Wang and Zhen Ye, "Spontaneous Emission in Cylindrical Periodically-Layered Structure", **Phys. Stat. Sol. (a)** 174, 527 (1999)
15. Alberto Alvarez Diaz, Cheng-Ching Wang, and Zhen Ye, "A Numerical Algorithm of the Multiple Scattering from an Ensemble of Arbitrary Scatters", **Journal of Computational Physics** 154,

Invited Talks

- Quantum Simulation with Cold Ions, CNLS, Los Alamos National Lab, Los Alamos, Dec. 18, 2012.
- Phonon Effects on Analog Quantum Simulation with Ultracold Ions in a Linear Paul Trap, Laboratory for Physical Sciences at University of Maryland, Maryland, March 7, 2012.
- Emergence of Effective Vortex Dynamics in Neutral Superfluids, CMT Seminar, Georgetown University, December 14, 2009.
- 2D Quantum Wells in the Interface of Transition Metal Oxides, Texas State University, March 11, 2009.
- 2D Quantum Wells in the Interface of Transition Metal Oxides, University of California at Irvine, December 10, 2008.

Contributed Talks

- Local Electronic Structure around a Single Impurity in an Anderson Lattice Model for Topological Kondo Insulators, APS March Meeting 2014, March 4, 2014
- Electronic Structure and Fermi-Surface Topology in PuIn_3 and PuSn_3 Compounds, APS March Meeting 2013, March 19, 2013.
- Phonon Mediated Quantum Spin Simulator made from a Two-Dimensional Wigner Crystal in Penning Traps, APS March Meeting 2013, March 19, 2013.
- Phonon Effects on Analog Quantum Simulation with Ultracold Ions in a Linear Paul Trap, APS March Meeting 2012, Boston, MA, Feb. 27, 2012.
- Emergent Effective Spin Models in Ion-Trap-Based Quantum Simulators, APS March Meeting 2011, Dallas, TX, March 21, 2011.
- Phonon Effects on Ion-Based Quantum Spin Simulators, APS March meeting 2010, Portland, Oregon, March 15, 2010.
- Charge Accumulation in Nonpolar Perovskite Quantum Well Sandwiched by Polar Mott-Insulating Perovskites, APS March Meeting 2008, New Orleans, Louisiana, March 12, 2008.
- Emergent Vortex Dynamics in 2D Superfluids, Spring Meeting of the Texas Section of the APS, October 18, 2007.

Poster Presentations

- Fermi Surface Properties and dHvA Orbits for PuIn_3 and PuSn_3 Compounds, LRDR Review Meeting, Feb. 14, 2013.
- Quantum wells in transition-metal oxide heterojunctions, Graphene Night, University of Texas at Austin, Nov. 10, 2008.
- Emergent vortex dynamics in 2D superfluids, APS March Meeting, New Orleans, Louisiana, March 12, 2008.

Conferences

- Princeton Summer School on Condensed Matter Physics, Spin liquids, matrix product states and entanglement, Princeton, NJ, August 5-8, 2013
- APS March Meeting, Baltimore, MD, March 17, 2013.
- APS March Meeting, Boston, MA, March 21, 2012.
- DARPA Optical Lattice Emulator (OLE)/AFOSR Quantum Simulation MURI Review Meeting, Hollywood, FL, December 6-8, 2011.
- DARPA Optical Lattice Emulator (OLE)/AFOSR Quantum Simulation MURI Review Meeting, Vail, CO, June 21-24, 2011.
- APS March Meeting, Dallas, TX, March 21, 2011.
- DARPA Optical Lattice Emulator (OLE)/AFOSR Quantum Simulation MURI Review Meeting, Hollywood, FL, December 7-9, 2010.
- Optical Lattice Emulator Phase II meeting, Houston, TX April, 2010.
- APS March meeting, Portland, Oregon, March 15, 2010.
- Optical Lattice Emulator Phase II Kick-Off Meeting, Miami, December 2-3, 2009.
- APS March Meeting, New Orleans, Louisiana, March 12, 2008.
- Graphene workshop, University of Texas at Austin, Nov 10, 2008.
- APS March Meeting, New Orleans, Louisiana, March 12, 2008.
- Spring Meeting of the Texas Section of the APS, October 18, 2007.

References

Prof. James Freericks

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