

BIOGRAPHICAL SKETCH

Shiwei Zhang

Department of Physics
College of William and Mary
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Employment History

2002-	Sally G. S. Spears Associate Professor	College of William and Mary
2001-	Associate Professor of Physics (with tenure)	College of William and Mary
1996-01	Assistant Professor of Physics	College of William and Mary
1995-96	University Postdoctoral Fellow and NSF CISE Postdoctoral Fellow	Ohio State University
1994-95	Postdoctoral Research Associate	Los Alamos National Laboratory

Education

1993	Ph.D. Physics	Cornell University
1988	B.S. Physics	University of Science and Technology of China

Selected Professional Activities

Visiting Associate Professor, International School for Advanced Studies (ISAS/SISSA), ITALY, Mar.-May 2003.

Participant, KITP (UCSB) Realistic Theories of Correlated Electron Materials Program, Nov. - Dec., 2002.

Visiting Associate Professor, Department of Physics, University of Illinois at Urbana-Champaign, Sept 2002 - Feb. 2003

Visiting Fellow, INT (Washington, Seattle) Numerical Methods for Strongly Interacting Systems Program, Oct.-Dec., 1997.

Participant, ITP (UCSB) Quantum Many-Body Computations Program, Feb., 1994.

Awards and Honors

Alumni Fellowship Award for teaching excellence, College of William and Mary, 2001.

Cottrell Scholar Award, Research Corporation, 2000.

CAREER Award, National Science Foundation, 1998-2003.

NSF CISE Postdoctoral Fellowship, 1996.

University Postdoctoral Fellowship, Ohio State University, 1995.

China-US Physics Examination & Application (CUSPEA) Scholarship, 1988.

Ten Significant Publications

1. Simone Chiesa, David Ceperley, and Shiwei Zhang, "Accurate, Efficient and Simple Forces with Quantum Monte Carlo Methods," *Phys. Rev. Lett.* **94**, 036406 (2005).
2. Wirawan Purwanto and Shiwei Zhang, "Correlation Effects in the Ground State of Trapped Boson Atomic Gases," *Phys. Rev. A* **72**, 053610 (2005).

3. "Quantum Monte Carlo method using phase-free random walks with Slater determinants," *Phys. Rev. Lett.* **90**, 136401 (2003), with Henry Krakauer.
4. "Quantum Monte Carlo Methods for Strongly Correlated Fermions," chapter in *Theoretical Methods for Strongly Correlated Electrons*, Ed. by D. Senechal, A.-M. Tremblay, and C. Bourbonnais, Springer (2003)
5. "Finite-Temperature Monte Carlo Calculations For Systems With Fermions," *Phys. Rev. Lett* **83**, 2777 (1999).
6. "Bunching Transitions on Vicinal Surfaces and Quantum N -mers," *Phys. Rev. Lett* **81**, 3475 (1998), with V. B. Shenoy and W. F. Saam.
7. "A Constrained Path Monte Carlo Method for Fermion Ground States," *Phys. Rev. B* **55**, 7464 (1997), with J. Carlson and J. E. Gubernatis.
8. "Pairing Correlations in the Two-Dimensional Hubbard Model," *Phys. Rev. Lett.* **78**, 4486 (1997), with J. Carlson and J. E. Gubernatis.
9. "Constrained Path Monte Carlo for Fermion Ground States," *Phys. Rev. Lett.* **74**, 3652 (1995), with J. Carlson and J. E. Gubernatis.
10. "Quantum Simulations of the Superfluid-Insulator Transition for 2-D, Disordered, Hard-Core Bosons," *Phys. Rev. Lett.* **74**, 1500 (1995) with N. Kawashima, J. Carlson, and J. E. Gubernatis.

Invited talks: over fifty (50) invited talks at international meetings, conferences, workshops, schools, and at research institutions.

Synergistic Activities

- One of twelve senior participants (from six institutions) in the Center for Piezoelectrics by Design (CPD), based at the College of William and Mary (W&M) and funded by the Office of Naval Research (2001-2006).
- Senior member of the DOE Computational Materials Science Network (cmsn) cooperative research team (CRT) on "Predictive capabilities for strongly correlated materials" (2003-2006).
- One of four PI's in W&M cross-disciplinary collaboration of NSF Education Innovation project, a year-long teaching and research program involving undergraduates in the sciences from W&M and Hampton University (HBCU): "Undergraduate modeling, simulation, and analysis" (1998-2003).
- Co-PI on NSF Major Research Instrumentation (MRI) grant to W&M for purchase of parallel computer cluster (1999-2002).
- Lecturer at multiple international summer/winter schools on numerical methods for correlated systems and quantum Monte Carlo.
- Co-organizer of an international workshop on "Electronic structure beyond density functional theory"; co-organizer of several DOE cmsn CRT workshops.

- Director of graduate studies in the Physics Department at W&M.
- Developed two new courses: “Applied mathematics and computation” for graduate students in Applied Science; and “Computational Physics” for graduate and advanced undergraduate students in Physics or Computational Science.

List of Graduate and Post-Graduate Advisors and Advisees

Ph. D. thesis advisor: M. H. Kalos

Post-graduate advisors: J. Carlson, J. E. Gubernatis, D. L. Cox, J. W. Wilkins

Graduate advisees: E. C. Allman, W. Purwanto, M. Suewattana

Post-graduate advisee: W. Al-Saidi, W. Purwanto