

## Lihui Chai

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### EDUCATION

#### Ph.D., Mathematics

Tsinghua University, Beijing, China

Sept 2008 - July 2013

Thesis advisor : Shi Jin

Thesis : Semiclassical Models for Quantum Systems and Band crossings

#### B.S., Mathematics

Tsinghua University, Beijing, China

Sept 2004 - July 2008

### EMPLOYMENTS

#### Visiting Assistant Professor

University of California, Santa Barbara,

July 2017 - present

#### Postdoctoral Research Associate

University of California, Santa Barbara,

Jan 2014 - July 2017

### ACADEMIC VISITS

- Sept - Nov 2013, *Visiting Researcher*, Computer, Electrical and Mathematical Sciences and Engineering in King Abdullah University of Science and Technology, Saudi Arabia.
- Feb - Aug 2012, *Visiting Student*, Department of Mathematics in Shanghai Jiaotong University, Shanghai, China.
- Sept 2010 - Dec 2011, *Honorary Fellow*, Department of Mathematics in University of Wisconsin-Madison, Madison, WI, U.S.A.

### RESEARCH INTERESTS

Multiscale analysis and computational methods related to partial differential equations arising from complex physical system including:

- Seismic wave propagation and inversion.
- Spin-transfer torque in micro-magnetics.
- Quantum tunnelings in quantum-chemistry and solid-state physics.

### PUBLICATIONS

- L. Chai, S. Jin and Q. Li, *Semiclassical Models for the Schrödinger Equation with Periodic Potentials and Band Crossings*, Kinetic and Related Models, 2013, 6(3):505-532.
- L. Chai, S. Jin, Q. Li and O. Morandi, *A multi-band semiclassical model for surface hopping quantum dynamics*, Multiscale Modeling & Simulation. 2015, 13(1):205-230.
- L. Chai, P. Tong, and X. Yang, *Frozen Gaussian approximation for 3-D seismic wave propagation*, Geophysical Journal International, 2017, 208(1):59-74.
- L. Chai, C. García-Cervera, and X. Yang, *Semiclassical limit of the Schrödinger-Poisson-Landau-Lifshitz-Gilbert system*, Archive for Rational Mechanics and Analysis, to appear.

- L. Chai, S. Jin, and P.A. Markowich, *A hybrid method for computing the Schrödinger equations with periodic potential with band-crossings in the momentum space*, Communications in Computational Physics, (a special issue in honor of the 80th birthday of Prof. Houde Han), to appear.
- L. Chai, C. García-Cervera, and X. Yang, *Diffusion limit of the Wigner-Landau-Lifshitz-Gilbert system in ferromagnetic materials*, submitted.
- L. Chai, P. Tong, and X. Yang, *Frozen Gaussian approximation for 3-D seismic tomography*, submitted.
- L. Chai, P. Tong, and X. Yang, *Global simulation of the 1998 Kamchatka earthquake data using frozen Gaussian approximation*, In preparation.
- J. Hateley, L. Chai, and X. Yang, *Frozen Gaussian approximation for 3-D elastic wave equations*, In preparation.
- L. Chai, E. Lorin, and X. Yang, *Frozen Gaussian approximation for 3-D Dirac equations*, In preparation.

## ACADEMIC SERVICES

- KI-Net Conference on Mean-field modeling and multiscale methods for complex physical and biological systems, University of California, Santa Barbara, Oct 31 - Nov 3, 2016. (Co-organized with Carlos García-Cervera and Xu Yang)
- Summer School on Quantum and Kinetic Theory for Complex Systems. Department of Mathematics, University of California, Santa Barbara, June 13-17, 2016. (Co-organized with Carlos García-Cervera and Xu Yang)
- The Second Pacific Rim Mathematical Association (PRIMA), Shanghai Jiaotong University, Shanghai, China, June 24-28, 2013. (Student Organizer)
- International Conference on Applied Mathematics, Shanghai JiaoTong University, Shanghai, China, Apr 16-20, 2012. (Student Organizer)

## CONFERENCE TALKS

- Southern California Applied Mathematics Symposium, University of California, Irvine, CA, June 3, 2017
- Workshop for Yong Mathematicians, Shanghai Jiaotong University, Shanghai, China, March 18-19, 2017
- Young Researcher's Workshop on Adiabatic and Semiclassical Quantum mechanics, University of Illinois at Chicago, Chicago, IL, April 22 - 23, 2017
- KI-Net Young Researchers Workshop on Stochastic and deterministic methods in kinetic theory, Duke University, Durham, NC, Nov 28 - Dec 2, 2016
- KI-Net Conference on Mean-field modeling and multiscale methods for complex physical and biological systems, University of California, Santa Barbara, CA, Oct 31 - Nov 3, 2016
- 7th International Conference on Multiscale Materials Modeling, Berkeley, CA, Oct 6-10, 2014.
- Mini-Workshop on Partial Differential Equations and Related Topics, Shanghai Jiaotong University, Shanghai, China, Dec 18, 2012.
- Ph.D. Candidate Forum on Computational and Applied Mathematics, Shanghai Jiaotong University, Shanghai, China, Oct 10-13, 2012.
- Workshop on Fast Algorithm of Partial Differential Equation, Peking University, Beijing, China, Aug 10-11, 2012.

## **CONFERENCE POSTERS**

- AGU Fall Meeting, San Francisco, December 12-16, 2016.