# SHIWEN ZHANG

CURRICULUM VITAE

*School of Mathematics, University of Minnesota*
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## Research Interests

- Mathematical Physics, Dynamical Systems, Spectral Theory, Harmonic Analysis

## Employment

- 05/2019-: Postdoctoral Associate, School of Mathematics & Simons Collaboration on Localization of Waves, University of Minnesota.
- 08/2016-05/2019: Visiting Assistant Professor, Department of Mathematics, Michigan State University.

## Education

- **09/2013-06/2016, University of California, Irvine** — Irvine, CA
  *Ph.D. Mathematics. Advisor: Svetlana Jitomirskaya*
- **09/2009-06/2013, Nanjing University** — Nanjing, China
  *Graduate Student; transferred to UC Irvine, September 2013. Advisor: Jiangong You*
- **09/2009-06/2010, BICMR, Peking University** — Beijing, China
  *Exchange graduate student program*
- **09/2005-06/2009, Nanjing University** — Nanjing, China
  *B.S. Mathematics, June 2009*

## Papers and Preprints

- D. N. Arnold, S. Mayboroda, W. Wang and S. Zhang, *Numerical analysis on the practical landscape law*. In preparation.
- D. N. Arnold, M. Filoche, S. Mayboroda, W. Wang and S. Zhang, *The landscape law for tight binding Hamiltonians.* arXiv:2101.03282. submitted.
- P. Desforges, S. Mayboroda, S. Zhang, G. David, D. N. Arnold, W. Wang, and Marcel Filoche *Sharp estimates for the integrated density of states in Anderson tight-binding models.* arXiv:2010.09287. submitted.
- S. Jitomirskaya, S. Zhang, *Quantitative continuity of singular continuous spectral measures and arithmetic criteria for quasiperiodic Schrödinger operators*. To appear in J. Eur. Math. Soc.
- R. Han, F. Yang, S. Zhang, *Spectral dimension for $\beta$-almost periodic singular Jacobi operators and the extended Harper's model*. To appear in Journal d'Analyse Mathématique.
- W. Wang and S. Zhang, *The exponential decay of eigenfunctions for tight binding Hamiltonians via landscape and dual landscape functions*. To appear in Ann. Henri Poincaré.
- J. Schenker, Z. Tilocco and S. Zhang, *Diffusion in the mean for a periodic Schrödinger equation perturbed by a fluctuating potential.* Commun. Math. Phys., 377, 1597-1635 (2020).
- **Lecture Notes.** S. Jitomirskaya, W. Liu and S. Zhang, *Arithmetic spectral transitions: a competition between hyperbolicity and the arithmetics of small denominators.* To appear in IAS/Park City Mathematics Series: Harmonic Analysis, 2018.
- F. Yang, S. Zhang, *Singular continuous spectrum and generic full spectral/packing dimension for unbounded quasiperiodic Schrödinger operators*. Ann. Henri Poincaré 20: 2481 (2019).
- S. Zhang, *The exact power law for Buffon's needle landing near some random Cantor sets*. Rev. Mat. Iberoam., Vol.36 (2), p.537-548 (2020).

- R. Han, S. Zhang, *Large deviation estimates and Hölder regularity of the Lyapunov exponents for quasi-periodic Schrödinger cocycles*. Int. Math. Res. Not., rnz319, (2019).
- S. Zhang, *Mixed spectral types for one frequency discrete quasiperiodic Schrödinger operator.* Proc. Amer. Math. Soc. 144, 2603-2609 (2016)
- J. You, S. Zhang, Q. Zhou, *Point spectrum for the quasiperiodic long range operators.* J. Spectr. Theory 4, 769-781 (2014)
- J. You, S. Zhang, *Hölder Continuity of the Lyapunov Exponent for Analytic Quasiperiodic Schrödinger Cocycle with Weak Liouville Frequency.* Ergodic Theory Dynam. Systems 34, 1395-1408 (2014)
- S. Zhang, Z. Zhao, *Diffusion bound and reducibility for discrete Schrödinger equations with tangent potential.* Frontiers of Mathematics in China 7, 1213-1235 (2012)

## Grants, Funding, and Awards

- Kovalevsky Outstanding PhD Thesis Award, UC Irvine 2016
- Euler Award for Outstanding Promise as a Graduate Student, UC Irvine 2014
- Samsung Scholarship, Nanjing University 2007
- National Encouragement Scholarship, Nanjing University 2006

## Recent Seminars, Conferences and Workshops

- Math Physics Seminar Talk, UCI, CA 11/15/2019
- Probability Seminar Talk, UCLA, CA 11/14/2019
- PDE Seminar Talk,University of Minnesota, MN 10/09/2019
- Dynamical Systems Seminar Talk, USTC, China 06/14/2019
- Analysis Seminar Talk, Yale University, CT 09/28/2018
- Dynamical Systems Seminar Talk, Tsinghua University, China 05/23/2018
- Dynamical Systems and Ergodic Theory Seminar Talk, UCR, CA 05/18/2018
- Math Physics Seminar Talk, UCI, CA 01/12/2018
- Dynamical Systems Seminar Talk, NJU, China 07/20/2017
- Analysis and PDE Seminar Talk, MSU, MI 10/31/2016
- Fractal Geometry Seminar Talk, Morningside center, CAS, China 05/22/2015
- Geometry-Analysis Seminar Talk, Rice University, Houston, TX 04/23/2014

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- Simons Collaboration on Localization of Waves Annual Meeting, New York, NY 02/20-21/2020
- Joint Mathematics Meetings AMS Special Sessions Talk, Baltimore 01/19/2019
- Spectral Theory of Quasi-Periodic and Random Operators, CRM, Montréal 11/12/2018
- Organizer, (together with I. Kachkovskiy and M. Cha), AMS Sectional Meeting, Special Session "Ergodic and Topological Quantum Systems", Ann Arbor, MI 10/20-10/21/2018
- Recent Advances in Functional Analysis, Kent State University, OH 10/13-10/14/2018
- Young Researchers Symposium at ICMP, McGill University, Montréal 07/21/2018
- PCMI Summer Session: Harmonic Analysis, Park City, Utah 07/01-07/21/2018
- AMS Special Session Talk, Portland State University, Portland, OR 04/14/2018
- Ohio River Analysis Meeting Parallel Session Talk, University of Kentucky 03/24/2018
- Joint Mathematics Meetings AMS Special Session Talk, San Diego, CA 01/13/2018
- Recent Developments in Harmonic Analysis, MSRI, Berkeley, CA 05/15-05/19/2017
- Ohio River Analysis Meeting, University of Cincinnati 03/25/2017
- Introductory Workshop: Harmonic Analysis, MSRI, Berkeley, CA 01/23-01/27/2017
- Joint Mathematics Meetings AMS Special Session Talk, Seattle, WA 01/06/2016
- AMS Special Session Talk, Fullerton, CA 10/24/2015

- Workshop: Spectral Properties of Quasicrystals Talk, BIRS, Oaxaca, Mexico 09/27/2015
- Ergodic Spectral Problems Workshop Talk, Isaac Newton Institute, UK 03/20-05/20/2015

## Teaching/General audience Talks

- Math. Department Colloquium, Oberlin College, Oberlin, OH. 09/20/2018
- Department Seminar, Loyola Marymount University, Los Angeles, CA. 11/05/2015
- Colloquium at CSULB, Long Beach, CA. 03/13/2015
- Geometry and Topology Seminar, CSUF, Fullerton, CA. 02/20/2015

## Teaching Experience

- Current teaching: **University of Minnesota**, Calculus I Fall 2020
- **University of Minnesota**, Calculus I Fall 2019
- Undergrad Rsearch Program Instructor at MSU (part of the Discovering America Program of Math department at MSU), together with I. Kachkovskiy
  Undergrad research team won the *Best Talk Award* in the 16th Annual Student Mathematical Conference at MSU Fall 2018, Spring 2019
- Teaching Assistant for lectures by Svetlana Jitomirskaya at the PCMI Graduate Summer School on Harmonic Analysis, Park City, *Arithmetic spectral transitions: a competition between hyperbolicity and the arithmetics of small denominators* July 8-14, 2018
- **Michigan State University** — East Lansing, MI
  *Instructor*
  - Linear Algebra Spring 2019
  - Calculus I Fall 2018, Spring 2018, Spring 2017
  - Calculus II Fall 2017, Fall 2016
- **University of California, Irvine** — Irvine, CA
  - Elementary Diff Equations (Teaching Assistant) Winter 2016
  - Math 2B(Instructor) Fall 2015
  - Math of Finance (Teaching Assistant) Summer 2015
  - Math 2B (Teaching Assistant) Fall 2014
- **Nanjing University** — Nanjing, China
  *Bachelor's Thesis Instruction Assistant*
  - Leader of undergraduate student thesis discussion group Spring 2012, Spring 2013