

Assistant Professor
Department of Mathematical Sciences, UMass Lowell
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Research Interests

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

Employment

- 08/2022-: Assistant Professor, Department of Mathematical Sciences, UMass Lowell.
- 05/2019-08/2022: 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, S. Zhang, *Numerical analysis on the practical landscape law*. In preparation.
- I. Chenn, S. Mayboroda, W. Wang, S. Zhang. *On a Novel Effective Equation of the Reduced Hartree-Fock Theory*. arXiv:2106.13887. submitted.
- I. Chenn, S. Zhang, *On the Reduced Hartree-Fock Equation with Anderson Type Background Charge Distribution*. arXiv:2105.00295. To appear in Journal of Functional Analysis 2022.
- D. N. Arnold, M. Filoche, S. Mayboroda, W. Wang, S. Zhang, *The landscape law for tight binding Hamiltonians*. Communications in Mathematical Physics (2022): 1-53.
- I. Chenn, W. Wang, S. Zhang, *Approximating the Ground State Eigenvalue via the Effective Potential*. Nonlinearity 35, no. 6 (2022): 3004.
- R. Han, S. Zhang, *Large deviation estimates and Hölder regularity of the Lyapunov exponents for quasi-periodic Schrödinger cocycles*. International Mathematics Research Notices 2022, no. 3 (2022): 1666-1713.
- P. Desforges, S. Mayboroda, S. Zhang, G. David, D. N. Arnold, W. Wang, M. Filoche *Sharp estimates for the integrated density of states in Anderson tight-binding models*. Physical Review A 104, no. 1 (2021): 012207.
- S. Jitomirskaya, S. Zhang, *Quantitative continuity of singular continuous spectral measures and arithmetic criteria for quasiperiodic Schrödinger operators*. Journal of the European Mathematical Society 24, no. 5 (2021): 1723-1767.
- W. Wang and S. Zhang, *The exponential decay of eigenfunctions for tight binding Hamiltonians via landscape and dual landscape functions*. Annales Henri Poincaré, vol. 22, no. 5, pp. 1429-1457. Springer International Publishing, 2021.

- R. Han, F. Yang, S. Zhang, *Spectral dimension for β -almost periodic singular Jacobi operators and the extended Harper's model*. Journal d'Analyse Mathématique 142, no. 2 (2020): 605-666.
- J. Schenker, Z. Tilocco and S. Zhang, *Diffusion in the mean for a periodic Schrödinger equation perturbed by a fluctuating potential*. Communications in Mathematical Physics 377, no. 2 (2020): 1597-1635.
- **Lecture Notes**. S. Jitomirskaya, W. Liu and S. Zhang, *Arithmetic spectral transitions: a competition between hyperbolicity and the arithmetics of small denominators*. in Harmonic analysis and applications. Vol. 27. American Mathematical Soc., 2020.
- S. Zhang, *The exact power law for Buffon's needle landing near some random Cantor sets*. Revista matemática iberoamericana 36, no. 2 (2019): 537-548.
- F. Yang, S. Zhang, *Singular continuous spectrum and generic full spectral/packing dimension for unbounded quasiperiodic Schrödinger operators*. Annales Henri Poincaré, vol. 20, no. 7, pp. 2481-2494. Springer International Publishing, 2019.
- S. Zhang, *Mixed spectral types for one frequency discrete quasiperiodic Schrödinger operator*. Proceedings of the American Mathematical Society 144, no. 6 (2016): 2603-2609.
- J. You, S. Zhang, Q. Zhou, *Point spectrum for the quasiperiodic long range operators*. Journal of Spectral Theory 4, no. 4 (2015): 769-781.
- J. You, S. Zhang, *Hölder Continuity of the Lyapunov Exponent for Analytic Quasiperiodic Schrödinger Cocycle with Weak Liouville Frequency*. Ergodic Theory and Dynamical Systems 34, no. 4 (2014): 1395-1408.
- S. Zhang, Z. Zhao, *Diffusion bound and reducibility for discrete Schrödinger equations with tangent potential*. Frontiers of Mathematics in China 7, no. 6 (2012): 1213-1235.

Grants, Funding, and Awards

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| • 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

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| • Colloquium job talk, Department of Mathematical Sciences, UMass Lowell, MA | 03/04/2022 |
| • Colloquium talk, Department of Mathematics, Wichita State University, KS | 01/31/2022 |
| • Colloquium talk, Department of Mathematics, University of Illinois at Chicago | 01/13/2022 |
| • Virtual seminar talk to Leipzig and Potsdam, | 01/12/2022 |
| • Colloquium talk, Department of mathematics and statistics, University of Reading, UK | 10/13/2021 |
| • Colloquium talk, Department of Mathematics, King's College London, UK | 08/04/2021 |
| • Math Physics Seminar Zoom Talk, UCI, CA | 04/15/2021 |
| • Math Physics and Operator Algebra Seminar Zoom Talk, MSU, MI | 03/08/2021 |
| • 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

- Simons Collaboration on Localization of Waves Annual Meeting, New York, NY 02/17-18/2022
- AMS Special Session Zoom Talk, San Francisco State University, CA 05/01/2021
- 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

- Colloquium talk, Department of Mathematics, CSU Los Angeles, CA 01/26/2022
- 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

- **University of Minnesota**, Basic Theory of Probability and Statistics Spring 2022
- **University of Minnesota**, Calculus I Fall 2019 Fall 2020 Fall 2021
- **University of Minnesota**, Differential Equations with Applications Spring 2021
- 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

Last updated: Thursday 8th September, 2022