

PENG ZHOU

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RESEARCH INTERESTS

Homological Mirror Symmetry, Geometric Representation Theory, Microlocal Sheaf theory, and Semi-Classical Analysis

JOBS

- 2022.7-2023.6, postdoc at UC Berkeley. Mentor: Mina Aganagic
- 2019.8-2022.6, Morrey Assistant Professor at UC Berkeley. Mentor: Vivek Shende
- 2017.9-2019.8, postdoc at IHES. Mentor: Maxim Kontsevich.

EDUCATION

2012-2017, Northwestern University

- Ph.D. Mathematics. Advisor: Eric Zaslow
- Thesis: From Fukaya-Seidel Category to Constructible Sheaves

2006-2012, University of Wisconsin-Madison

- Ph.D. Physics (cosmology). Advisor: Daniel Chung
- Thesis: Gravitational Fermion Production during Inflation.

2002-2006, Peking University

- B.S., Physics major, Math minor

PUBLICATIONS

12. Jesse Huang and Peng Zhou. Variation of GIT and variation of Lagrangian skeletons II: Quasi-symmetric case. *Advances in Mathematics*, 408:108597, 2022
11. Nero Budur, Robin van der Veer, Lei Wu, and Peng Zhou. Zero loci of Bernstein-Sato ideals-II. *Selecta Mathematica*, 27(3):1-30, 2021
10. Nero Budur, Robin van der Veer, Lei Wu, and Peng Zhou. Zero loci of Bernstein-Sato ideals. *Inventiones mathematicae*, 225(1):45-72, 2021
9. Lei Wu and Peng Zhou. Log-modules and index theorems. In *Forum of Mathematics, Sigma*, volume 9. Cambridge University Press, 2021
8. Peng Zhou. Lagrangian skeleta of hypersurfaces in $(C^*)^n$. *Selecta Mathematica*, 26:26, 2020

¹Updated December 4, 2022

7. Peng Zhou. Twisted polytope sheaves and coherent-constructible correspondence for toric varieties. *Selecta Mathematica*, 25(1):1, 2019
6. Steve Zelditch and Peng Zhou. Interface asymptotics of partial Bergman kernels around a critical level. *Arkiv för Matematik*, 57(2):471–492, 2019
5. Steve Zelditch and Peng Zhou. Central limit theorem for spectral partial Bergman kernels. *Geometry & Topology*, 23(4):1961–2004, 2019
4. Steve Zelditch and Peng Zhou. Interface asymptotics of partial Bergman kernels on S^1 -symmetric Kähler manifolds. *Journal of Symplectic Geometry*, 17(3):793–856, 2019
3. Steve Zelditch and Peng Zhou. Pointwise Weyl Law for Partial Bergman Kernels. *Algebraic and Analytic Microlocal Analysis*, page 589, 2018
2. Boris Hanin, Steve Zelditch, and Peng Zhou. Scaling of harmonic oscillator eigenfunctions and their nodal sets around the caustic. *Communications in Mathematical Physics*, 350(3):1147–1183, 2017
1. Boris Hanin, Steve Zelditch, and Peng Zhou. Nodal sets of random eigenfunctions for the isotropic harmonic oscillator. *International Mathematics Research Notices*, 2015(13):4813–4839, 2015

PREPRINTS

4. Jesse Huang and Peng Zhou. GKZ discriminant and Multiplicities. *arXiv preprint arXiv:2206.14778*, 2022
3. Peng Zhou. Variation of GIT and variation of Lagrangian skeletons I: flip and flop. *arXiv preprint arXiv:2011.03719*, 2020
2. Bohan Fang and Peng Zhou. Gamma II for toric varieties from integrals on T-dual branes and homological mirror symmetry. *arXiv preprint arXiv:1903.05300*, 2019
1. Peng Zhou. Sheaf Quantization of Legendrian Isotopy. *arXiv preprint arXiv:1804.08928*, 2018

TALKS

17. Sep 23, 2022. MSRI. Approaches to Khovanov homology reading group *Title: Homological Mirror Symmetry for 3d Coulomb branches and cKLRW algebra*
16. Aug 29, 2022. UC Berkeley. Informal String-Math Seminar. *Title: Homological Mirror Symmetry for 3d Coulomb branches and Skein-Strand diagram.*
15. Apr 6, 2022. UC Davis. Algebraic Geometry Seminar *Title: Variation of GIT quotients and Variation of Lagrangian skeletons*
14. Jan 31, 2022. Columbia University. Enumerative Geometry Seminar *Title: Variation of GIT quotients and Variation of Lagrangian skeletons*
13. Sep 28, 2021. Michigan State University. Geometry and Topology Seminar. *Title: Homological Mirror Symmetry for A_n -type cluster varieties.*
12. Mar 18, 2021. Boston College, Number Theory/Algebraic Geometry. *Title: Variation of GIT and Variation of Lagrangian skeleton*
11. Feb 26, 2021. UC Santa Barbara. Seminar on Geometry and Arithmetic. *Title: Derived Equivalences from Variation of Lagrangian Skeletons.*
10. April 23, 2020. Kansas State University M-seminar *Title: Variation of toric GIT quotient and variation of Lagrangian skeleton*

9. Mar 2, 2020. UC Berkeley. Informal String-Math Seminar
Title: Variation of toric GIT quotients and Variation of Lagrangian skeleton
8. May 17, 2019. Lyon University - I.
Title: Interpolating Lagrangian Skeleta and variation of GIT
7. May 2, 2019. King's College of London and University College of London, Geometry seminar.
Title: Interpolating Lagrangian Skeleta and variation of GIT
6. May 4, 2018. Groupe de travail sur la topologie symplectique (Paris Region)
Title: Lagrangian skeleton of affine hypersurface in $(C^)^n$*
5. April 18, 2018. Algebra Seminar (Münster University, Germany)
Title: Deformation of constructible sheaves and Coherent-Constructible Correspondence
4. Mars 12, 2018. Séminaire: Problèmes Spectraux en Physique Mathématique (Paris)
Title: Zero set of eigenfunction for harmonic oscillators
3. Feb 20th, 2018. Analysis and Geometry Seminar (Paris VI)
Title: Interface of Partial Bergman kernel
2. April 27, 2016. Mirror Symmetry Seminar (Kansas State University).
Title: Combinatorial Lefschetz Thimble and Circuit Transition
1. Jan 9, 2016. AMS Seattle Regional Meeting.
Title: Nodal Sets of Harmonics Oscillator Near the Caustics

ORGANIZATION

Seminars

- I co-organized the UC Berkeley **Informal String-Math Seminar**, with Mina Aganagic, Andrei Okounkov, and Ivan Danilenko (2022 Fall). [Seminar website](#).
- I organized a learning seminar with Yixuan Li on **3d mirror symmetry** during 2021 spring semester.

JOURNALS REFEREED

- Advances in Mathematics
- Communications in Mathematical Physics
- Tunisian Journal of Mathematics
- Pure and Applied Math Quarterly
- Journal of Differential Geometry
- Journal of Topology
- Communications in Analysis and Geometry

TEACHING EXPERIENCE

As Instructor in UC Berkeley

- Introduction to Real Analysis (Math 104)
- Mathematical Tools in Physical Science (Math 121A, 121B)

- Introduction to Complex Analysis (Math 185)
- Introduction to Differential Geometry (Math 214)
- Linear Algebra (Math 54)

As TA in Northwestern University

- (Graduate) Real Analysis
- (Graduate) Probability
- Probability and stochastic process,
- Dynamical System
- Linear Algebra
- Linear Optimization

DIRECTED READING PROJECTS

I advised a few undergrads reading projects in UC Berkeley.

- 2022 Fall: Cohomology of Flag varieties
- 2022 Summer: Differentiable Manifold
- 2022 Spring: Introduction to Group and Representation theory
- 2021 Summer: Random Matrix Theory.
- 2021 Summer: Differentiable Manifold.

AWARDS

- 2017 Best Thesis Award. By Northwestern Mathematics Department.
- 2015-16 Gelfand Award (for contribution to the math department). By Northwestern Mathematics Department.
- 2015-16 Mathematics Department Graduate Teaching Assistant Award.
- 2013-14 Department Nomination for Presidential Fellowship