

# Bohan Zhou

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CONTACT INFORMATION	Department of Mathematics, Dartmouth College, 27 N. Main Street, 6188 Kemeny Hall, Hanover, NH 03755-3551	(+1)530-746-1534 <a href="mailto:Bohan.Zhou@dartmouth.edu">Bohan.Zhou@dartmouth.edu</a> <a href="http://www.math.dartmouth.edu/~bzhou">www.math.dartmouth.edu/~bzhou</a>
RESEARCH INTERESTS	(branched) optimal transport, image and data science, shape optimization, calculus of variations, mixing problem, partial differential equations.	
EDUCATION	Department of Mathematics, UC Davis, USA <b>PhD in Applied Mathematics</b> (Sep 2014 - June 2020) <ul style="list-style-type: none"><li>• Advisor: Qinglan Xia</li><li>• Dissertation : From optimal mixing flows to optimal transport and vice versa.</li></ul> Department of Mathematics, UC Davis, USA <b>M.S. in Applied Mathematics</b> (Sep 2014 - Dec 2016) <ul style="list-style-type: none"><li>• Initial Advisor: Joseph Biello, Steve Shkoller</li></ul> Department of Mathematics, Zhejiang University, P.R.China <b>B.S. in Mathematics &amp; Applied Mathematics</b> (Sep 2010 - June 2014) <ul style="list-style-type: none"><li>• Advisor: Zhi (George) Lin</li><li>• Math &amp; Applied Math (Elite Students) in Chu Kochen Honors College</li></ul>	
ACADEMIC APPOINTMENTS	Department of Mathematics, Dartmouth College, USA <b>Byrne Instructor in Applied Mathematics</b> (Sep 2020 - current) <ul style="list-style-type: none"><li>• Mentor: Anne Gelb</li></ul>	
PUBLICATIONS PREPRINT EXPOSITORY PAPER	<ol style="list-style-type: none"><li>1. Q. Xia and B. Zhou. <i>The existence of minimizers for an isoperimetric problem with Wasserstein penalty term in unbounded domains.</i> Advances in Calculus of Variations (2021). (<a href="https://doi.org/10.1515/acv-2020-0083">https://doi.org/10.1515/acv-2020-0083</a>).</li><li>2. B. Zhou. <i>A note on the equivalence between various mixing scales.</i> (Expository paper, available at: <a href="https://www.math.ucdavis.edu/~bhzhouzhou/Equivalence_between_various_mixing_scales.pdf">https://www.math.ucdavis.edu/~bhzhouzhou/Equivalence_between_various_mixing_scales.pdf</a>).</li><li>3. B. Zhou and M. Parno. <i>Efficient and exact multimarginal optimal transport with pairwise costs.</i> ArXiv: 2208.03025 (submitted).</li><li>4. A. Gelb, Y. Lee, J. Lindbloom and B. Zhou <i>A stochastic proximal gradient algorithm to speckled SAR image.</i> In preparation.</li><li>5. B. Zhou <i>Revisit Bressan's mixing conjecture in 1D via matrix functions.</i> In preparation.</li></ol>	

STUDENT MENTORSHIP	<p>PhD student Jonathan Lindbloom, <i>Research project on a despeckling problem</i>, Dartmouth College, 2021-. (Joint with Prof. Gelb and Prof. Lee)</p> <p>Undergraduate student Tyler Chen, <i>Independent research project on computational optimal transport</i>, Dartmouth College, 2021-.</p>
TALKS & POSTER PRESENTATIONS	<p>Summer school on Analysis and Applied Math. Münster, Germany. (Sep 2022)</p> <p>SIAM annual meeting. Pittsburgh, USA. (July 2022)</p> <p>PIMS-IFDS-NSF Summer school on Optimal Transport. Seattle, USA. (June 2022)</p> <p>Dartmouth Colloquium. Hanover, USA. (May 2022)</p> <p>2022 NSF FRG Workshop on Discrete Shapes at Harvard CMSA. Boston, USA. (May 2022)</p> <p>SIAM conference on Uncertainty Quantification. Atlanta, USA. (April 2022)</p> <p>Recent Developments in Geometric Measure Theory and its Applications on the occasion of Bob Hardt's retirement. Rice University, USA. (March 2022)</p> <p>MURI annual meeting. Dartmouth College, USA. (October 2021)</p> <p>Analysis Seminar. University of Rochester, USA. (Zoom, November 2020)</p> <p>Mathematical Research Seminar. Zu Chongzhi Center for Mathematics and Computational Sciences, Duke Kunshan, China. (Zoom, June 2020)</p> <p>Computational Optimal Transport Seminar. UC Davis, USA. (June 2019, August 2019, October 2019)</p> <p>USC Summer School on Mathematical Fluids. University of Southern California, USA. (May 2017)</p> <p>Student-Run Math and Applied Math Seminar. UC Davis, USA. (May 2017)</p>
ACADEMIC SERVICES	<p>Organizer of Reading group on optimization, Dartmouth College. (March 2021 - present)</p> <p>Organizer of Applied &amp; Computational Mathematics Seminar, Dartmouth College. (Sep 2020 - June 2021, Sep 2022 - June 2023)</p> <p>Organizer of Reading Seminar on Gradient Flow and Evolutionary PDEs, UC Davis. (July 2019 - June 2020)</p> <p>Student staff of Summer School and Workshop: Mathematical Analysis of Water Waves and Related Models, UC Davis Bodega Marine Laboratory, USA. (June 2017)</p>
DIVERSITY AND COMMUNITY SERVICES	<p>Selection Committee for Essay Contest on "Biographies of Contemporary Women in Mathematics". (Feb, 2022)</p>
CONFERENCE & WORKSHOP	<p>Dynamics and Discretization: PDEs, Sampling, and Optimization. Simons Institute,</p>

CA, USA. (October 2021)

Recent advances in Gradient Flows, Kinetic Theory, and Reaction-Diffusion Equations. Vienna, Austria. (Zoom, July 2021)

AMS Mathematics Research Communitis on Analysis in Metric Spaces. (Zoom, June 2021)

Shape Optimization, Spectral Geometry and Calculus of Variations. CIRM, Luminy, France. (Zoom, March 2021)

Winter School: Analysis and Applied Mathematics. Münster, Germany. (Zoom, Feb 2021)

MIT 2020 - Calculus of Variations, Homogenization and Disorder. Boston, MA, USA. (Zoom, August 2020)

Optimal Transport, Topological Data Analysis and Applications to Shape and Machine Learning. Columbus, OH, USA. (Zoom, July 2020)

MSRI Hot Topics Workshop: Optimal transport and applications to machine learning and statistics. Berkeley, CA, USA. (Zoom, May 2020)

Winter School: Turbulence in fluids and PDEs. Lausanne, Switzerland. (January 2020)

iN $\delta$ AM workshop: People in Optimal Transport and Applications. Cortona, Italy. (June 2019)

5th Applied Mathematics Symposium Münster: Transport, Mixing and Fluids. Münster, Germany. (Feb 2019)

Workshop: Optimal Transport: Numerical Methods and Applications. Lake Como School of Advanced Studies, Italy. (May 2018)

Summer School and Workshop: Mathematical Analysis of Water Waves and Related Models. UC Davis Bodega Marine Laboratory, USA. (June 2017)

USC Summer School on Mathematical Fluids. UC Los Angeles, USA. (May 2017)

The 2<sup>rd</sup> International Conference on Interdisciplinary Applied & Computational Mathematics. Zhejiang University, China. (June 2013)

HONORS AND AWARDS

March 2022	Travel Support, Rice.
Jan 2020	Travel Support, EPFL.
June 2019	Travel Support, iN $\delta$ AM.
Feb 2019, Sep 2022	Travel Support, Mathematics Münster.
2018-2020	Departmental Travel Award, UC Davis.
2017	Graduate Program Fellowship, UC Davis.
2013	Exchange Students Scholarship, Zhejiang University.
2012	Academic Perfection of Global Study Program, UC Davis.

GRADUATE COURSEWORK

Real, complex, harmonic, functional analysis; Linear, nonlinear, nonlocal evolutionary PDEs; Asymptotic methods; Optimal transport and information geometry; Numerical

methods for PDEs; harmonic analysis on networks and graphs.

TEACHING  
EXPERIENCES

**Instructor:** Calculus; Differential equations; Elementary algebra; Linear Algebra; Probability; Introduction to Statistics.

**Teaching Assistant:** Analysis (graduate level); Calculus; Calculus for biology and medicine; Short calculus; Differential equations; Linear algebra; Applied linear algebra; Introduction to abstract math.

PROFESSIONAL  
AFFILIATION

American Mathematical Society. (2015 - present)

Society for Industrial and Applied Mathematics. (2015 - present)

REFERENCE  
PROFESSORS

- Prof. Anne Gelb (Postdoc mentor), Dartmouth College, [annegelb@math.dartmouth.edu](mailto:annegelb@math.dartmouth.edu)
- Prof. Qinglan Xia (PhD advisor), UC Davis, [qlxia@math.ucdavis.edu](mailto:qlxia@math.ucdavis.edu)
- Dr. Matthew Parno (on research), Dartmouth College, [parnomd@gmail.com](mailto:parnomd@gmail.com)
- Prof. Zhi Lin (on research), Zhejiang University, [linzhi80@zju.edu.cn](mailto:linzhi80@zju.edu.cn) [saito@math.ucdavis.edu](mailto:saito@math.ucdavis.edu)
- Lecturer Emeritus Lawrence J Marx (on teaching), UC Davis, [marx@math.ucdavis.edu](mailto:marx@math.ucdavis.edu)
- Prof. John Voight (on teaching), Dartmouth College, [jvoight@gmail.com](mailto:jvoight@gmail.com)

RELEVANT  
SKILLS

Programming: Proficiency in C, Matlab, Python,  $\LaTeX$ , SQL.

Languages: Mandarin (Native), English (Fluent).

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*Last Updated: October 3, 2022*