

Wei Wang

Curriculum Vitae

Education

Sept. 2022 – **Ph.D. Candidate in Theoretical Mathematics, Peking University**

Present Advisor: Prof. Zhifei Zhang

June – Sept. **Summer Research Program, HKUST**

2021 Advisor: Prof. Tianling Jin

Sept. 2018 – **B.S. in Mathematics and Applied Mathematics, Zhejiang University**

June 2022 Advisor: Prof. Ting Zhang

Thesis: *Homogenization Problem of Second Order Elliptic Systems with Lower Order Terms*

Research Interests

Areas I study nonlinear elliptic and parabolic partial differential equations motivated by problems in geometry, materials science, and continuum mechanics. My work combines techniques from the calculus of variations and geometric measure theory.

Topics I am interested in variational theories for liquid crystals, such as the Landau–de Gennes model, and in the analysis of the fine structure of semilinear elliptic and parabolic equations.

Published papers

- [3] R. L. Frank, T. Jin, and W. Wang, On the sharp constants in the regional fractional Sobolev inequalities, *Partial Differential Equations and Applications*, 6 (2025), 1–20.
- [2] W. Wang, Uniform estimates of resolvents in the homogenization theory of elliptic systems, *Journal of Differential Equations*, 370 (2023), 1–65.
- [1] W. Wang and T. Zhang, Homogenization theory of elliptic systems with lower order terms in dimension two, *Communications on Pure and Applied Analysis*, 22 (2023), 787–824.

Preprints

- [7] H. Fu, H. Wang, and W. Wang, Uniform estimates of Landau-de Gennes minimizers in the vanishing elasticity limit with line defects, *arXiv preprint arXiv:2508.01811*, submitted.
- [6] H. Fu, H. Wang, and W. Wang, Improved convergence of Landau-de Gennes minimizers in the vanishing elasticity limit, *arXiv preprint arXiv:2507.14955*, submitted.
- [5] W. Wang, W. Wang, and Z. Zhang, Existence of weak solutions for two-phase matrix-valued harmonic map flows, *arXiv preprint arXiv:2506.16278*, submitted.

- [4] H. Fu, W. Wang, K. Wu, and Z. Zhang, Stratification and rectifiability of harmonic map flows via tangent measures, *arXiv preprint arXiv:2504.14880*, submitted.
- [3] W. Wang and Z. Zhang, Fine structure of rupture set for semilinear elliptic equations with singular nonlinearity, *arXiv preprint arXiv:2411.16048*, submitted.
- [2] H. Fu, W. Wang, and Z. Zhang, Quantitative stratification and sharp regularity estimates for supercritical semilinear elliptic equations, *arXiv preprint arXiv:2408.06726*, submitted.
- [1] W. Wang and Z. Zhang, Landau-de Gennes model with sextic potentials: asymptotic behavior of minimizers, *arXiv preprint arXiv:2404.00677*, submitted.

Talks and Presentations

Conference/Workshop Talks

- Nov. 2025 2025 Jinhua Conference on Harmonic Analysis and Its Applications, Zhejiang Normal University
Title: *Stratification for Harmonic Map Flows via Tangent Measures: Rectifiability and Regularity*
- Nov. 2025 The 3rd National Academic Exchange Forum for Doctoral Students in Frontier Mathematics, Peking University
Title: *Vanishing Elasticity Limit and Defect Analysis in the Landau-de Gennes Model*
- Aug. 2025 Conference on the Theory and Computation of Quasi Crystals, Nankai University
Title: *Improved Convergence of Landau-de Gennes Minimizers in the Vanishing Elasticity Limit*
- Dec. 2024 Year-End Conference of the PDE Group, Peking University
Title: *Semilinear Elliptic Equation with Singular Nonlinearity: Regularity and Singularity*
- Aug. 2022 Exhibition of ICCM Creative Undergraduate Thesis, Southeast University, China
Title: *Homogenization of Elliptic Systems with Lower Order Terms*

Seminar/Colloquium Talks

- June 2025 PDE and Geometry Seminar, Zhejiang University
Title: *Rectifiability of the Stratification for Harmonic Map Flows via Tangent Measures*

Poster Presentations

- Apr. 2025 2025 Graduate Research Exhibition of the School of Mathematical Sciences, Peking University
Title: *Fine Structure of Rupture Set for Semilinear Elliptic Equation with Singular Nonlinearity*
- Apr. 2024 2024 Graduate Research Exhibition of the School of Mathematical Sciences, Peking University
Title: *Landau-de Gennes Model with Sextic Potentials: Asymptotics of Minimizers and Defects*

Teaching and Teaching Assistant Experience

Peking University

- Fall 2025 Teaching Assistant, Advanced Mathematics (C) (I)
- Spring 2025 Teaching Assistant, Advanced Mathematics (B) (II)
- Fall 2024 Teaching Assistant, Advanced Mathematics (A) (I)
- Spring 2024 Teaching Assistant, Advanced Mathematics (B) (II)
- Fall 2023 Teaching Assistant, Harmonic Analysis
- Spring 2023 Teaching Assistant, Functional Analysis (I)
- Fall 2022 Teaching Assistant, Advanced Mathematics (C) (I)

Zhejiang University

- Spring 2022 Teaching Assistant, Mathematical Analysis (II)
- Fall 2021 Teaching Assistant, Mathematical Analysis (I)

Honors and Awards

- Apr. 2025 1st Prize, Graduate Research Exhibition, School of Mathematical Sciences, Peking University
- Apr. 2024 3rd Prize, Graduate Research Exhibition, School of Mathematical Sciences, Peking University
- Oct. 2023 Excellence Program for Graduate Students in Mathematics (Class of 2022), Peking University
- Aug. 2022 Nomination Award, ICCM Creative Undergraduate Thesis, Southeast University, China
- June 2022 Outstanding Graduate, Zhejiang University
- June 2022 Honored Degree, Chu Kochen College, Zhejiang University
- June 2021 Nomination Award, S.-T. Yau College Student Mathematics Contest, Tsinghua University
- Apr. 2021 1st Prize, 11th Chinese Mathematics Competitions Finals, Chinese Mathematical Society

Technical Skills

- Software L^AT_EX, MATLAB, Mathematica
- Languages English (fluent), Mandarin Chinese (native)