Yixuan Wang (Roy)

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Applied and Comput. Math., Caltech, Pasadena, CA 91125

EDUCATION BACKGROUND

Peking University
B.S., School of Mathematics, Peking University, Beijing, China 2016—2020
Elite Undergraduate Training Programs in Applied Math and in Pure Math, Excellent Graduate **Summa Cum Laude** in Beijing

California Institute of Technology
Graduate Student, Applied + Computational Mathematics, supervised by Prof. Thomas Hou 2020—2026

PUBLICATIONS

- R. Li, Y. Wang and **Y. Wang**. Approximation to Singular Quadratic Collision Model in Fokker-Planck-Landau Equation, SIAM Journal on Scientific Computing, 42(3), 2020, pp. B792-B815.
- Y. Chen, T.Y. Hou and **Y. Wang**. Exponential Convergence for Multiscale Linear Elliptic PDEs via Adaptive Edge Basis Functions, Multiscale Modeling and Simulation, 19(2), 2021, pp. 980–1010.
- Z. Liu, S. Qian, **Y. Wang,** Y. Yan and T Yang. Schrödinger Principal-component Analysis: On the Duality between Principal-component Analysis and the Schrödinger Equation, Physics Review E, 104(2), 2021, 025307.
- Y. Chen, T.Y. Hou and **Y. Wang**. Exponentially Convergent Multiscale Methods for 2D High Frequency Heterogeneous Helmholtz Equations, Multiscale Modeling and Simulation, 21(3), 2023, pp. 849–883.
- Z. Liu, A. Stuart and **Y. Wang**. Second Order Ensemble Langevin Method for Sampling and Inverse Problems, Communications in Mathematical Sciences, 23(5), 2025, 1299-1317.
- H. Maust, Z. Li, **Y. Wang**, D. Leibovici, O. Bruno, T.Y. Hou and A. Anandkumar. Fourier Continuation for Exact Derivative Computation in Physics-Informed Neural Operators, NeurIPS 2022, 3rd AI for Science workshop.
- Y. Chen, T.Y. Hou and **Y. Wang**. Exponentially Convergent Multiscale Finite Element Method, Communications on Applied Mathematics and Computation, 6(2), 2024, 862-878.
- T.Y. Hou and **Y. Wang**. Blowup Analysis for a Quasi-exact 1D Model of 3D Euler and Navier-Stokes, Nonlinearity, 37(3), 2024, 035001.
- T.Y. Hou, V.T. Nguyen and **Y. Wang**. (2024) L^2-based Stability of Blowup with Log Correction for Semilinear Heat Equation.
- Z. Liu, **Y. Wang**, S. Vaidya, F. Ruehle, J. Halverson, M. Soljacic, T.Y. Hou and M. Tegmark. KAN: Kolmogorov-Arnold Networks, ICLR Oral 2025.
- J. Chen, T.Y. Hou, V.T. Nguyen and **Y. Wang.** (2024) On the Stability of Blowup Solutions to the Complex Ginzburg-Landau Equation in R^d.
- Z. Liu, P. Ma, **Y. Wang**, W. Matusik and M. Tegmark. (2024) KAN 2.0: Kolmogorov-Arnold Networks Meet Science.
- **Y. Wang,** J.W. Siegel, Z. Liu and T.Y. Hou. On the Expressiveness and Spectral Bias of KANs, ICLR 2025.
- Z. Li, S. Lanthaler, C. Deng, **Y. Wang**, K. Azizzadenesheli and A. Anandkumar. Scale-consistent Learning with Neural Operators, Neurips 2024, Workshop Foundation Models for Science: Progress, Opportunities, and Challenges.
- J. Liu, **Y. Wang,** and T. Zhou. (2025) Finite Time Blowup for Keller-Segel Equation with Logistic Damping in Three Dimensions.
- **Y. Wang**, Z. Liu, Z. Li, A. Anandkumar, and T.Y. Hou. (2025) High Precision PINNs in Unbounded Domains: Application to Singularity Formulation in PDEs.

SELECTED INVITED TALKS

- Ensemble Hamiltonian Monte Carlo, EnKF workshop at Balestrand, Norway, May. 2022
- ExpMsFEM, University of Hong Kong, Sep. 2022
- Blowup for a quasi-exact 1D model of 3D Euler, Workshop on Fluids at Duke University, May. 2023
- ExpMsFEM, Minisymposium on rough PDEs, ICIAM at Waseda University, Aug. 2023
- ExpMsFEM, Ohio State University, Nov. 2023
- KAN, National University of Singapore, Aug. 2024

- Stable type-I blowup by local normalization conditions: NLH and CGL, NUS, Aug. 2024
- KAN, Peking University, Sep. 2024
- Stable type-I blowup by local normalization conditions: NLH and CGL, PKU, Sep. 2024
- KAN, Shanghai Jiaotong University, Sep. 2024
- KAN, UCLA, Sep. 2024
- KAN, University of Chicago, Oct. 2024
- KAN, Courant Institute, NYU, Nov. 2024
- Stable type-I blowup by local normalization conditions: NLH and CGL, Duke, Nov. 2024
- KAN, University of Hong Kong, Nov. 2024
- Stable type-I blowup, NCTS workshop on PDEs at National Taiwan University, Apr. 2025
- KAN, ICLR Oral at Singapore, Apr. 2025
- KAN and high precision training of PINNs, Seoul National University, June. 2025
- High precision training of PINNs, Brown University, Sep. 2025
- Singularity formation: synergy in theoretical, numerical and machine learning approaches, Texas A&M University, Sep. 2025
- Singularity formation, Caltech, Oct. 2025

MATHEMATICAL ENGAGEMENT

- Founding President of the SIAM Student Chapter at Caltech 2021-2023
- Member of DEI committee at Caltech

TEACHING EXPERIENCE

- ACM 106a (Numerical linear algebra) 22/23/24/25 Fall ACM 106b (Numerical analysis) 23/24/25 Winter
- ACM 107a (Linear analysis) 21 Fall ACM 107b (Real and functional analysis) 22 Winter
- ACM 127 (Calculus of variations) 22 Spring
- ACM 180a (Multiscale modeling) 23 Spring
- ACM 270 (Machine learning for inverse problems and data assimilation) 24 Spring

AWARDS AND HONORS

- Silver Award at 56th International Mathematical Olympiad, 2016
- All Three 2nd Places in Analysis, Applied Math, and Overall Individual Competitions, S.-T. Yau College Mathematics Contests, 2019
- 1st Place in Team Competition, S.-T. Yau College Mathematics Contests, 2019
- 1st Prize in National University Math Competition, 2017
- 1st Prize in National University Math Modeling Competition, 2017
- 1st Place in Citadel Datathon, China, 2018
- National Scholarship, 2018, 2019
- Representative of PKU for National Scholarship, 2019
- PKU Person of the Year, 2019
- PKU May 4th-Award, 2020