Jiajie Chen

Department of Math, UChicago
5734 S University Ave
Chicago IL, 60637
Homepage: jiajiechen94.github.io
Email: jiajiechen@uchicago.edu

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EMPLOYMENT

Department of Mathematics, University of Chicago — Chicago, IL
Assistant Professor — Sep 2025 - Present

Courant Institute, New York University — New York, NY
Courant Instructor — Sep 2022 - Aug 2025

EDUCATION

California Institute of Technology — Pasadena, California
Ph.D. in Applied and Computational Mathematics — Aug 2017 –June 2022
Advisor: Prof. Thomas Y. Hou

Peking University — Beijing, China
B.S. in Mathematics, Minor in Economics — Sep 2013 –July 2017
Undergrad research advisors: Profs. Pingwen Zhang, Zhifei Zhang

The Affiliated High School of SCNU — Guangzhou, China
Middle School and High School — Sep 2007 –June 2013

AWARDS, HONORS AND GRANTS

- NSF Research Grant DMS-2408098 (PI) — 2024-
- AMS-Simon travel grant (declined due to conflict with NSF grant) — 2024
- W. P. Carey & Co. Prize for outstanding doctoral dissertations in Applied Mathematics, Caltech — 2022
- National Scholarship, Peking University — 2014
- Chinese Mathematical Olympiad (CMO), Gold Medal (Full Score) — 2013

RESEARCH INTERESTS

Partial differential equations, mathematical fluid mechanics

PUBLICATIONS

19. J. Chen, & T. Y. Hou. Singularity formation in 3D Euler equations with smooth initial data and boundary. *Proceedings of the National Academy of Sciences 122, no. 27,* 2025.

18. T. Buckmaster, & J. Chen. Blowup for the defocusing septic complex-valued nonlinear wave equation in $\mathbb{R}^{4+1}$. *preprint arXiv:2410.15619,* submitted, 2024.

17. J. Chen. Vorticity blowup in compressible Euler equations in $\mathbb{R}^d, d \geq 3$. *Annals of PDE, 11(2), 1-71,* 2025.

16. J. Chen, T.Y. Hou, V.T. Nguyen, & Y. Wang. On the stability of blowup solutions to the complex Ginzburg-Landau equation in $\mathbb{R}^d$. *preprint arXiv:2407.15812,* submitted, 2024.

15. J. Chen, G. Cialdea, S. Shkoller, & V. Vicol. Vorticity blowup in 2D compressible Euler equations. *preprint arXiv:2407.06455,* submitted, 2024.

14. J. Chen. Nearly self-similar blowup of the slightly perturbed homogeneous Landau equation with very soft potentials. *preprint arXiv:2311.11511,* submitted, 2023.

13. J. Chen. Remarks on the smoothness of the $C^{1,\alpha}$ asymptotically self-similar singularity in the 3D Euler and 2D Boussinesq equations. *Nonlinearity 37.6,* 2024.

12. J. Chen, & T. Y. Hou. Stable nearly self-similar blowup of the 2D Boussinesq and 3D Euler equations with smooth data II: Rigorous Numerics. *Multiscale Modeling & Simulation, 23(1), 25-130,* 2025.

11. J. Chen, & T. Y. Hou. Stable nearly self-similar blowup of the 2D Boussinesq and 3D Euler equations with smooth data I: Analysis. *preprint arXiv:2210.07191,* submitted, 2023.

10. J. Chen, & T. Y. Hou. On stability and instability of $C^{1,\alpha}$ singular solutions to the 3D Euler and 2D Boussinesq equations. *Comm. Math. Phys. 405, 112,* 2024.

9. J. Chen. On the regularity of the De Gregorio model for the 3D Euler equations. *J. Eur. Math. Soc.,* 2023.

8. J. Chen, T. Y. Hou, & D. Huang. Asymptotically self-similar blowup of the Hou-Luo model for the 3D Euler equations. *Ann. PDE 8, 24,* 2022.

7. J. Chen. On the slightly perturbed De Gregorio model on S^1. *Arch. Rational Mech. Anal. 241, 1843–1869,* 2021.

6. J. Chen, & T. Y. Hou. Finite time blowup of 2D Boussinesq and 3D Euler equations with $C^{1,\alpha}$ velocity and boundary. *Comm. Math. Phys. 383(3), 1559-1667,* 2021.

5. J. Chen. Singularity formation and global well-posedness for the generalized Constantin–Lax–Majda equation with dissipation. *Nonlinearity, 33(5), 2502,* 2020.

4. J. Chen, T. Y. Hou, & D. Huang. On the finite time blowup of the De Gregorio model for the 3D Euler equation. *Comm. Pure Appl. Math. 74(6), 1282-1350,* 2021.

3. J. Chen, P. Zhang, & Z. Zhang. Local minimizer and De Giorgi's type conjecture for the isotropic–nematic interface problem. *Calc. Var. Partial Differential Equations 57, no. 5, Paper No. 129, 19 pp,* 2018.

2. J. Chen, A. Hou, & T. Y. Hou. A pseudo knockoff filter for correlated features. *Inf. Inference 8, no. 2, 313–341,* 2019.

1. J. Chen, A. Hou, & T. Y. Hou. A prototype knockoff filter for group selection with FDR control. *Inf. Inference 9, no. 2, 271–288,* 2020.

INVITED TALKS

- PDE Seminar, Brown University, Oct 2024.
- Differential Equations Seminar, University of Michigan, Sep 2024.
- PDE seminar, Fudan University, Shanghai, Aug 2024.
- PDE seminar, Peking University, July 2024.
- PDE seminar, AMSS, Chinese Academic of Science, July 2024.
- Singularities in incompressible flows: computer-assisted proofs and physics-informed neural networks, University of Minnesota, Apr 2024.
- PDE seminar, AMSS, Chinese Academic of Science (Online), Apr 2024.
- AMS Southeastern Sectional Meeting, Florida State University, Mar 2024.
- Analysis & PDE Seminar, UCLA, March 2024.
- Analysis seminar, University of Maryland, Feb 2024.
- Analysis seminar, University of Texas at Austin, Jan 2024.
- Calderón-Zygmund Analysis Seminar, University of Chicago, Nov 2023.

- Workshop on Recent Developments in Applied Mathematics and its Applications, Caltech, Nov 2023.
- "Infinite dimensional Geometry and Fluids" workshop, Banff (BIRS), Nov 2023
- Analysis seminar, Rochester University, Sep 2023.
- Minisymposium on Recent Developments in Fluid Dynamics, ICIAM 2023 Tokyo (online), Aug 2023.
- Workshop on Scientific Computing, Institute of Computational Mathematics and Scientific Engineering Computing, Chinese Academy of Sciences, Aug 2023.
- PDE Seminar, Southern University of Science and Technology, China, July 2023.
- PDE Seminar, Zhejiang University, July 2023.
- Workshop on Recent Advances in PDEs (XIV), Shanghai Jiaotong University, July 2023.
- Loo-Keng Hua Forum for Young Mathematicians, Lecture II & III, AMSS, Chinese Academic of Science, June, July 2023.
- Series of lectures, School of Mathematical Sciences, Peking University, June 2023.
- Forum for Young Mathematicians, Shenzhen University, June 2023.
- IMS PDE Seminar, Chinese University of Hong Kong, June 2023.
- Conference on Recent Advances in Mathematical Fluid Dynamics, Duke University, May 2023.
- PDE and Applied Math Seminar, University of California, Davis (online), Apr 2023.
- Loo-Keng Hua Forum for Young Mathematicians, AMSS, Chinese Academic of Science (Online), Apr 2023.
- Applied Math & Analysis Seminar, Duke University, Mar 2023.
- PDE Seminar, Penn State University, Mar 2023.
- AMS Southeastern Sectional Meeting, Georgia Tech, Mar 2023.
- Nonlinear Analysis Seminar, Rutgers University, Mar 2023.
- Chinese Webinar on Analysis & PDE, Feb 2023.
- School Colloquium, Peking University (online), Dec 2022.
- IMS PDE Seminar, Chinese University of Hong Kong (online), Dec 2022.
- Analysis Seminar, NYU Courant Institute, Nov 2022.
- Analysis of Fluids and Related Topics, Princeton University, Nov 2022.
- Chinese Webinar on Analysis & PDE, Sep 2022.
- Invited lecturer of UMN Summer Workshop on Analysis of PDEs, IMA, University of Minnesota, July 2022.
- Invited member of AIM Square: Towards a 3D Euler singularity, AIM, San Jose, July 2022.
- Stanford Applied Math Seminar, Stanford University (online), Apr 2022.
- Caltech/UCLA/USC Joint Analysis Seminar, Caltech, Apr 2022.
- Workshop on recent developments in incompressible fluid dynamics, Institute for Advanced Study, Apr 2022.
- PDE Seminar, University of Minnesota, Mar 2022.
- Applied Math & Analysis Seminar, Duke University, Nov 2021.
- CMX Student and Postdoc Seminar, Caltech, Oct 2021.
- Applied Math Seminar, University of New Mexico (online), Sep 2021.
- Computational and Applied Math Ph.D. Students Workshop, Peking University (online), Sep 2021.
- PDE Seminar, Seoul National University (online), Aug 2021.
- Chinese Webinar on Analysis & PDE, Aug 2021.
- Student-Run Analysis & PDE, University of California, Davis (online), Jan 2021.
- Analysis Seminar, Korea Institute for Advanced Study (online), Dec 2020.
- PDE Seminar, University of Minnesota (online), Nov 2020.

- Mathematical Research Seminar, Duke Kunshan University (online), Nov 2020.
- Differential Equations Seminar, University of Michigan, Jan 2020.
- Workshop on mathematics of fluid motion III: theory and computation, Korea Institute for Advanced Study, Dec 2019.
- PDE Seminar, Nonlinear PDE Center, Chung-Ang University, Korea, Dec 2019.
- Analysis and PDE Seminar, University of California, San Diego, Nov 2019.
- Analysis and PDE Seminar, Peking University, Beijing, China, Sep 2019.
- Invited member of AIM Square: Towards a 3D Euler singularity, AIM, San Jose, May 2018, Aug 2019.
- Workshop on fluid turbulence and singularities of the Euler/ Navier Stokes equations, Harvard University, Mar 2019.
- Workshop on multiscale problems in materials science and biology: analysis and computation, Tsinghua Sanya International Mathematics Forum, Jan 2018.

Teaching

Instructor at New York University

MATH-UA 121. Calculus 1.	Fall 2024
MATH-UA 263. Partial Differential Equations.	Fall 2023, Spring 2024
MATH-UA 262. Ordinary Differential Equations.	Fall 2022, Spring 2023

Instructor at other institutes

UMN Summer Workshop on Analysis of PDEs, IMA, University of Minnesota.	Summer 2022

Teaching Assistant at Caltech

ACM 109. Mathematical Modelling.	Spring 2021
ACM 217. Advanced Topics in Stochastic Analysis.	Winter 2021
ACM 204. Randomized Algorithms for Linear Algebra.	Winter 2020
CMS/ACM 117. Probability Theory and Stochastic Processes.	Fall 2019, Fall 2020
ACM 95/100b. Introductory Methods of Applied Mathematics.	Spring 2019, Spring 2020
ACM 106b. Introductory Methods of Computational Mathematics.	Winter 2019
ACM 106a. Introductory Methods of Computational Mathematics.	Fall 2018

Service

Co-organizer of the CMX Student / Postdoc Seminar at Caltech, Oct 2020 – Mar 2021, Oct 2021 – Dec 2021.

Languages

English (fluent), Cantonese (native), Chinese (native).