

Jiajie Chen

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

Updated September, 2025

EMPLOYMENT

Department of Mathematics, University of Chicago
Assistant Professor

Chicago, IL
Sep 2025 - Present

Courant Institute, New York University
Courant Instructor

New York, NY
Sep 2022 - Aug 2025

EDUCATION

California Institute of Technology
Ph.D. in Applied and Computational Mathematics
Advisor: Prof. Thomas Y. Hou

Pasadena, California
Aug 2017 – June 2022

Peking University
B.S. in Mathematics, Minor in Economics
Undergrad research advisors: Profs. Pingwen Zhang, Zhifei Zhang

Beijing, China
Sep 2013 – July 2017

The Affiliated High School of SCNU
Middle School and High School

Guangzhou, China
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. *To appear in Duke Math. J.*, *preprint arXiv:2407.06455*, 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

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| • 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

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| • UMN Summer Workshop on Analysis of PDEs, IMA, University of Minnesota. | Summer 2022 |
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Teaching Assistant at Caltech

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| • 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).