Jincheng Yang

Curriculum Vitae

Appointments

2024–2025	**Member**, *Institute for Advanced Study*, Princeton, NJ
2022–2024	**L.E. Dickson Instructor**, *University of Chicago*, Chicago, IL
2017	**Visiting Scholar**, *Georgia Institute of Technology*, Atlanta, GA

Education

2017–2022	**Ph.D. in Mathematics**, *The University of Texas at Austin*, Austin, TX
	Advisor: Luis Caffarelli and Alexis Vasseur
2013–2017	**B.Sc. in Mathematics and Applied Mathematics** (Honors Program), *Xi'an Jiaotong University*, China
2011–2013	**Special Class for the Gifted Young**, *Xi'an Jiaotong University*, China

Research Interests

APDE	**Analysis and Partial Differential Equations**, *dynamical systems, fluid dynamics, kinetic theory*
	Euler equation, Navier–Stokes equation, Boltzmann equation, Fokker–Planck equation.
MSOR	**Management Science and Operation Research**, *distributionally robust optimization, optimal mass transportation, risk measure*
	Inventory problem, risk management, portfolio optimization.

Publications and Preprints

[1] Fei Cao and Jincheng Yang. Quantitative convergence guarantees for the mean-field dispersion process. *arXiv e-prints*, 2024. `arXiv:2406.05043`.

[2] Jincheng Yang. Vorticity interior trace estimates and higher derivative estimates via blow-up method. *arXiv e-prints*, 2023. `arXiv:2308.09350`.

[3] Jincheng Yang, Luhao Zhang, Ningyuan Chen, Rui Gao, and Ming Hu. Decision-making with side information: a causal transport robust approach. *OptOnline e-prints*, 2022. `OptOnline:20639`.

[4] Luhao Zhang, Jincheng Yang, and Rui Gao. A short and general duality proof for Wasserstein distributionally robust optimization. *Oper. Res.*, 2024. Forthcoming. `arXiv:2205.00362`, `doi:10.1287/opre.2023.0135`.

[5] Alexis F. Vasseur and Jincheng Yang. Layer separation of the 3d incompressible Navier–Stokes equation in a bounded domain. *Comm. Partial Differential Equations*, 49(4):381–409, 2024. `arXiv:2303.05236`, `doi:10.1080/03605302.2024.2346146`.

[6] Luhao Zhang, Jincheng Yang, and Rui Gao. Optimal robust policy for feature-based newsvendor. *Manag. Sci.*, 70(4):2315–2329, 2024. `OptOnline:18579`. `doi:10.1287/mnsc.2023.4810`.

[7] Alexis F. Vasseur and Jincheng Yang. Boundary vorticity estimates for Navier–Stokes and application to the inviscid limit. *SIAM J. Math Anal.*, 55(4):3081–3107, 2023. `arXiv:2110.02426`, `doi:10.1137/22m1503567`.

[8] Jincheng Yang. Construction of maximal functions associated with skewed cylinders generated by incompressible flows and applications. *Ann. Inst. H. Poincaré C Anal. Non Linéaire*, 39(4):793–818, 2022. `arXiv:2008.05588`, `doi:10.4171/aihpc/20`.

[9] Alexis F. Vasseur and Jincheng Yang. Second derivatives estimate of suitable solutions to the 3D Navier-Stokes equations. *Arch. Ration. Mech. Anal.*, 241(2):683–727, 2021. `arXiv:2009.14291`, `doi:10.1007/s00205-021-01661-4`.

[10] Zhiwu Lin, Jincheng Yang, and Hao Zhu. Barotropic instability of shear flows. *Stud. Appl. Math.*, 144(3):289–326, 2020. `arXiv:1801.00950`, `doi:10.1111/sapm.12297`.

[11] Jincheng Yang and Zhiwu Lin. Linear inviscid damping for Couette flow in stratified fluid. *J. Math. Fluid Mech.*, 20(2):445–472, 2018. `arXiv:1610.08924`, `doi:10.1007/s00021-017-0328-3`.

Ph.D. Thesis

Title	*Partial regularity results for the three-dimensional incompressible Navier–Stokes equation*
Advisors	Prof. Luis Caffarelli and Prof. Alexis Vasseur
Description	We show a series of works of some regularity results on the incompressible Navier–Stokes equation in dimension three.

Undergraduate Thesis

Title	*Linear Inviscid Damping of a Shear Flow in a Half-Space and a Finite Channel*
Advisors	Prof. Dongsheng Li and Prof. Zhiwu Lin
Description	We show the decay rate for velocity and density variation to linearized Euler equations near stratified Couette flow under optimal regularity.

Honors and Awards

May 2022	Frank Gerth III Outstanding Dissertation Award, *UT Austin*
Mar 2021	University Graduate Continuing Fellowship, *UT Austin*
June 2020	Frank Gerth III Teaching Excellence Award, *UT Austin*
Apr 2019	Senate of College Council's TA of the Year, *UT Austin*
June 2018	Frank Gerth III Graduate Excellence Award, *UT Austin*
Oct 2016	Outstanding Student (The highest honor on campus, $^{10}/_{30000}$), *XJTU*
Sept 2016	National Scholarship, *Ministry of Education, China*

Invited Talks

Oct 2024	Informs Annual Meeting 2024, *Seattle*

Aug 2024	Probaaility Seminar, *University of Illinois Urbana-Champaign*
Jun 2024	EquaDiff 2024, *Karlstad University*
May 2024	Recent Advances in Nonlinear Partial Differential Equations, *University of Minnesota*
May 2024	SITE Research Center Talk Series, *New York University Abu Dhabi (zoom talk)*
Mar 2024	AMS Spring Southeastern Sectional Meeting, *Florida State University*
Feb 2024	Simons Turbulence Seminar, *Johns Hopkins University (zoom talk)*
Nov 2023	Calderón-Zygmund Analysis Seminar, *University of Chicago*
Nov 2023	PDE Seminar, *Purdue University*
Oct 2023	Applied Mathematics and Statistics Seminar, *Johns Hopkins University*
Oct 2023	8th Annual Meeting of the SIAM Central States Section, *University of Nebraska-Lincoln*
Aug 2023	10th International Congress on Industrial and Applied Mathematics, *Waseda University (zoom talk)*
Jul 2023	PDE and Applications Seminar, *Chinese Academy of Sciences*
May 2023	Midwest PDE Seminar, *University of Notre Dame*
Jan 2023	Calderón-Zygmund Analysis Seminar, *University of Chicago*
Dec 2022	PDE and Applications Seminar, *Chinese Academy of Sciences (zoom talk)*
Nov 2022	Analysis of Fluids and Related Topics, *Princeton University*
Oct 2022	Informs Annual Meeting 2022, *Indianapolis*
May 2021	AMS Spring Western Sectional Meeting, *San Francisco State University (zoom talk)*
Mar 2021	AMS Spring Eastern Sectional Meeting, *Brown University (zoom talk)*

Service

Seminar Organizing

2023–2024	**Calderón–Zygmund Analysis Seminar**, *University of Chicago*
2019	**Harmonic Analysis Reading Seminar**, *University of Texas at Austin*

Journal Refereeing

SIAM Journal on Mathematical Analysis

Journal of Differential Equations

Mathematical Programming

Teaching Experience

Instructor

Spring 2024	Math 18500 – Mathematical Methods in the Physical Sciences III
Winter 2024	Math 27300 – Basic Theory of Ordinary Differential Equations
Spring 2023	Math 18500 – Mathematical Methods in the Physical Sciences III
Winter 2023	Math 20400 – Analysis in $\mathbb{R}^n$ II
Fall 2022	Math 18500 – Mathematical Methods in the Physical Sciences III

Teaching Assistant

Spring 2021	M383D – Methods of Applied Mathematics II

2019-2020	M427J – Differential Equations with Linear Algebra
Fall 2018	M427L – Advanced Calculus for Applications II
Spring 2018	M408D – Sequences, Series, and Multivariable Calculus
Fall 2017	M408K – Differential Calculus

Mentoring Undergraduate Students

Research Experience for Undergraduates

Summer 2024	Minh Pham, *on the topic of Nonlinear Integral Equations*
Summer 2024	Michael Lee, *on the topic of Partial Regularity Theory of Navier-Stokes Equations*
Summer 2024	Zichen Lu, *on the topic of Inviscid Damping of Euler Equations*

Reading Course

Spring 2024	Dante Strollo and Jakob Wellington, *on the topic of Fourier Analysis*

Directed Reading Program

Summer 2024	Ariana Qin, *on the topic of Stochastic Calculus and Stochastic Control*
Spring 2024	Ariana Qin, *on the topic of Optimal Control Theory*
Fall 2021	Kyle Alkire, *on the topic of Schauder Theory in Elliptic Equations*
Spring 2020	Yongqi Pang, *on the topic of Statistics and Data Analysis*
Spring 2019	Trey Minor, *on the topic of Differential Equations and Dynamical Systems*
Spring 2018	Yan Cheng, *on the topic of Probability and Martingales*