

# JINDONG WANG

## Contact and Personal Information

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Mathematical Institute, University of Oxford  
Radcliffe Observatory, Andrew Wiles Building, Oxford OX2 6GG

jindong.wang@maths.ox.ac.uk  
<https://jindong24.github.io>

## Employment

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<b>Royal Society Newton International Fellow</b> Mathematical Institute, University of Oxford	<i>Jan 2026 – present</i> Mentor: Kaibo Hu
<b>Postdoctoral Fellow</b> Applied Mathematics and Computational Sciences, KAUST	<i>Sep 2025 – Jan 2026</i> Mentor: Jinchao Xu
<b>Postdoctoral Scholar</b> Department of Mathematics, The Pennsylvania State University	<i>Sep 2024 – Aug 2025</i> Mentors: Wenrui Hao and Jinchao Xu

## Education

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<b>Ph.D. in Computational Mathematics</b> School of Mathematical Sciences, Peking University	<i>2019 - 2024</i> Advisor: Shuonan Wu
<b>Bachelor in Mathematics and Applied Mathematics</b> School of Mathematical Sciences, Tongji University	<i>2015 - 2019</i>

## Research Interests

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My research focuses on numerical methods for partial differential equations (PDEs), with particular emphasis on the finite element method and the development of stable, structure-aware discretisations. Recently, my work has concentrated on finite element methods for advection–diffusion problems involving differential forms, motivated by applications in magnetohydrodynamics and related transport-dominated systems. In parallel, I have been developing efficient multigrid solvers for the resulting large-scale linear systems, with the aim of ensuring robustness and scalability. Alongside these classical numerical approaches, I am also exploring directions in scientific machine learning, with a particular interest in operator learning for PDEs.

## Publications

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### Journal Articles

- [1] Haochen Li, Yangfan Luo, **Jindong Wang** and Shuonan Wu. *A streamline upwind/Petrov-Galerkin method for the magnetic advection-diffusion problem*, Computer Methods in Applied Mechanics and Engineering, 451, Article No. 1118678, 2026.
- [2] Yangfan Luo, **Jindong Wang** and Shuonan Wu. *Local projection stabilization methods  $\mathbf{H}(\text{curl})$  and  $\mathbf{H}(\text{div})$  advection problems*, Journal of Computational and Applied Mathematics, 476, Article No. 117129, 2026.
- [3] Wenrui Hao, and **Jindong Wang**. *Laplacian Eigenfunction-Based Neural Operator for Learning Non-linear Partial Differential Equations*, Journal of Computational Physics, 543, Article No. 114400, 2025.
- [4] **Jindong Wang**, and Shuonan Wu. *A robust solver for  $\mathbf{H}(\text{curl})$  convection-diffusion and its local Fourier analysis*, SIAM Journal on Scientific Computing, 47(2), A838–A865, 2025.

- [5] **Jindong Wang**, and Shuonan Wu. *A hybridizable discontinuous Galerkin method for magnetic advection-diffusion problems*, Journal of Scientific Computing, 99, Article No. 86, 2024.
- [6] **Jindong Wang**, and Shuonan Wu. *Discontinuous Galerkin methods for magnetic advection-diffusion problems*, Computers and Mathematics with Applications, 174, 43–54, 2024.
- [7] **Jindong Wang**, Jinchao Xu, and Jianqing Zhu. *CNNs with compact activation function*. International Conference on Computational Science. Springer, Cham, 319–327, 2024.
- [8] Bing Dong, **Jindong Wang**, and Wei Xu. *Risk metrics evaluation for variable annuities with various guaranteed benefits*. The Journal of Derivatives 28.2, 59–79, 2020.
- [9] **Jindong Wang**, and Wei Xu. *Risk-based capital for variable annuity under stochastic interest rate*. ASTIN Bulletin: The Journal of the IAA 50.3, 959–999, 2020.

## Preprints

- [10] **Jindong Wang**, Yutong Mao, Xiao Liu and Wenrui Hao. *Learning Patient-Specific Spatial Biomarker Dynamics via Operator Learning for Alzheimer’s Disease Progression*, submitted, arXiv:2507.16148, 2025.
- [11] **Jindong Wang**, and Shuonan Wu. *Exponentially-fitted finite elements for  $\mathbf{H}(\text{curl})$  and  $\mathbf{H}(\text{div})$  convection-diffusion problems*, submitted, arXiv:2308.07680, 2023.

## Selected Honors and Awards

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- Excellent Doctoral Dissertation Award, Peking University, 2024
- Excellent Graduate, Peking University, 2024
- College Scholarship, School of Mathematical Sciences of Peking University, 2023
- Excellent Research Award, Peking University, 2020-2022
- Diren Scholarship, Peking University, 2021
- Huawei Scholarship, Peking University, 2020
- Provincial Outstanding Graduate, Shanghai, China, 2019
- National Scholarship, China, 2018

## Invited Talks

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1. Workshop on Scientific Machine Learning and Applications, University of Hawaii at Manoa, USA, Jan 2026.
2. CAARMS Conference 2025, Penn State University, USA, July 2025.
3. KAUST International Research Conference on Multi-Grid and Multi-Scale Methods in Computational Science, KAUST, Saudi Arabia, Feb 2025.
4. 2024 SIAM New York-New Jersey-Pennsylvania Section Conference, Rochester Institute of Technology, USA, Nov 2024.
5. 9th PKU Workshop on Numerical Methods for PDEs, Peking University, China, Dec 2023.
6. 1st Beijing Workshop on Mathematics for Ph.D. candidate, Peking University, China, Oct 2023.

## Grants

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1. 2026-2028, Royal Society Newton International Fellowship, £283,683

## Teaching Activities

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- Assistant instructor, AMCS394T: Mathematical Theory of Neural Networks, Fall 2025 (Instructor: Prof. Jinchao Xu)
- Instructor, Math 456: Numerical Computation II, Spring 2025, Penn State University
- Teaching Assistant, Applied Partial Differential Equations, Spring 2024 (Instructor: Prof. Pingbing Ming)

## Academic Experience

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- Research Visit, ETH Zürich, Zürich, Switzerland, May 2024
- Visiting Student, King Abdullah University of Science and Technology, Saudi Arabia, Nov 2022–April 2023