

# Zhuoyuan Li

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the Institute for Functional Intelligent Materials  
National University of Singapore

## Education

2020–2025      **Ph.D.**, School of Mathematical Sciences, Peking University, Beijing, China  
co-supervisors: Prof. Pingwen Zhang<sup>1</sup>, Prof. Bin Dong<sup>2</sup>  
2016–2020      **B.Sc.**, School of Mathematics, Sichuan University, Chengdu, China

## Working Experience

2025–present      Research Fellow      the Institute for Functional Intelligent Materials  
National University of Singapore, Singapore

## Research Experience

2022–present      deep learning in data assimilation  
2020–2022      deep learning in numerical weather prediction

## Publications

🔍 [Google Scholar](#)

† → Equal contribution; \* → Corresponding author(s)

## Journal Articles

- J1. **Zhuoyuan Li**, Dong\*, B. & Zhang\*, P. State-observation augmented diffusion model for nonlinear assimilation with unknown dynamics. *Journal of Computational Physics*, 114240. ISSN: 0021-9991. <https://doi.org/10.1016/j.jcp.2025.114240> (2025).
- J2. **Zhuoyuan Li**\*, Dong, B. & Zhang, P. Latent assimilation with implicit neural representations for unknown dynamics. *Journal of Computational Physics* **506**, 112953. ISSN: 0021-9991. <https://doi.org/10.1016/j.jcp.2024.112953> (2024).

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<sup>1</sup>homepage: <https://www.math.pku.edu.cn/pzhang/en/>

<sup>2</sup>homepage: <http://faculty.bicmr.pku.edu.cn/~dongbin/>

## Preprints

- P1. Yang<sup>†</sup>, P., Feng<sup>†</sup>, Y., Chen<sup>†</sup>, Z., Wu, Y. & **Zhuoyuan Li**<sup>\*</sup>. Spend Wisely: Maximizing Post-Training Gains in Iterative Synthetic Data Bootstrapping. *arXiv preprint arXiv:2501.18962*. <https://arxiv.org/abs/2501.18962> (2025).
- P2. Huang<sup>†</sup>, X., **Zhuoyuan Li**<sup>†</sup>, Z., Liu, H., Wang, Z., Zhou, H., Dong<sup>\*</sup>, B. & Hua, B. Learning to simulate partially known spatio-temporal dynamics with trainable difference operators. *arXiv preprint arXiv:2307.14395*. <https://arxiv.org/abs/2307.14395> (2023).

## Talks

CSIAM 2024	Oct. 24-27, 2024	“Latent assimilation with implicit neural representations for unknown dynamics” (Selected Poster)
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## Teaching

### Peking University

Spring 2023	Assistant Instructor, Advanced Algebra (II)
Fall 2022	Assistant Instructor, Advanced Algebra (I)
Spring 2022	Assistant Instructor, Advanced Algebra (II)
Fall 2020	Teaching Assistant <sup>3</sup> , Advanced Mathematics (C)

Please see my homepage for more details.

## Other Experience

May 2024	China Meteorological Administration Tornado Key Laboratory ( <a href="#">link</a> , in Chinese) – location: Foshan, Guangdong, China – deploy a CNN-based model for tornado detection and classification
Summer 2018	research internship organized by <a href="#">MITACS</a> – location: University of Alberta, Edmonton, AB, Canada – topic: multi-marginal optimal transport (advisor: Prof. Brendan Pass)

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<sup>3</sup>without teaching tasks