Weiyu Shen, Ph.D.

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Education

09/2019 - 07/2024 **Ph.D.** in Fluid Mechanics
State Key Laboratory for Turbulence and Complex Systems,
College of Engineering, Peking University, China
Supervisor: Prof. Yue Yang

09/2015 – 06/2019 **B.S.** in Naval Architecture and Ocean Engineering
Huazhong University of Science and Technology (HUST), China

Positions

09/2024 – present **Postdoctoral Fellow**
Max Planck Institute for Solar System Research, Germany
Supervisor: Dr. Xiaojue Zhu

Research Interests

I have always had a strong interest in bringing new perspectives to complex physical systems, especially fluid dynamics. My current research includes topological fluid dynamics, magnetohydrodynamics, quantum and classical turbulence, vortex dynamics, multi-physics turbulent flows, complex fluids and numerical methods.

Publications

6. **W. Shen**, J. Yao, and Y. Yang, "Designing turbulence with entangled vortices", *Proceedings of the National Academy of Sciences* of the United States of America, 121(35), e2405351121 (2024). doi:10.1073/pnas.2405351121

5. Z. Zhang, P. Li, M. Xiong, L. Zhang, J. Chen, X. Lei, X. Pan, X. Wang, X.-Y. Deng, **W. Shen**, Z. Mei, K.-K. Liu, G. Liu, Z. Huang, S. Lv, Y. Shao, and T. Lei, "Continuous production of ultratough semiconducting polymer fibers with high electronic performance", *Science Advances*, 10, eadk0647 (2024). doi:10.1126/sciadv.adk0647

4. **W. Shen**, J. Yao, F. Hussain, and Y. Yang, "Role of internal structures within a vortex in helicity dynamics", *Journal of Fluid Mechanics*, 970, A26 (2023). doi:10.1017/jfm.2023.620

3. Z. Meng, **W. Shen**, and Y. Yang, "Evolution of dissipative fluid flows with imposed helicity conservation", *Journal of Fluid Mechanics*, 954, A36 (2023). doi:10.1017/jfm.2022. 878

2. J. Yao, **W. Shen**, Y. Yang, and F. Hussain, "Helicity dynamics of viscous vortex

links", *Journal of Fluid Mechanics*, 944, A41 (2022). doi:10.1017/jfm.2022.532

1. **W. Shen**, J. Yao, F. Hussain, and Y. Yang, "Topological transition and helicity conversion of vortex knots and links", *Journal of Fluid Mechanics*, 943, A41 (2022). doi:10.1017/jfm.2022.464

Invited Talks

12/2023 BIRS-IASM Workshop: Vortex Dynamics: the Crossroads of Mathematics, Physics and Applications, Hangzhou, China
"Weaving turbulence with intertwined vortex tubes"

Contributed Presentations

08/2024 26th ICTAM, Daegu, South Korea
"Weaving classical turbulence with quantum skeleton" (Oral)

11/2023 76th APS Division of Fluid Dynamics Meeting, Washington DC, USA
"Weaving classical turbulence with quantum skeletons" (Oral)

09/2023 18th European Turbulence Conference, Valencia, Spain
"Role of internal structures within a vortex in helicity dynamics" (Oral)

07/2023 JFM/FLOW Symposium China, Hefei, China
"Role of internal structures within a vortex in helicity dynamics" (Poster)

11/2022 75th APS Division of Fluid Dynamics Meeting, Indianapolis, USA
"Bursting vortex ring with differential twist" (Oral)

11/2022 12th National Conference on Fluid Mechanics, Xi'an, China
"Bursting vortex ring" (Oral)

11/2022 Chinese Congress on Theoretical and Applied Mechanics, Chengdu, China
"Topological and helicity conversion of vortex knots and links" (Oral)

11/2021 74th APS Division of Fluid Dynamics Meeting, Phoenix, USA
"Vortex Blooming" (Gallery of Fluid Motion, doi:10.1103/APS.DFD.2021.GFM.P0008)

10/2021 2nd National Forum for Doctoral Students in Mechanics, Hangzhou, China
"Topological and helicity conversion of vortex knots and links" (Oral)

12/2020 11th National Conference on Fluid Mechanics, Shenzhen, China
"Helicity components transformation in the evolution of coiled vortex rings" (Oral)

11/2020 1st National Forum for Doctoral Students in Mechanics, Beijing, China
"Helicity components transformation in the evolution of coiled vortex rings" (Oral)

Honors and Awards

2024 Excellent Doctoral Dissertation, Peking University

2023 Cushman & Wakefield Scholarship, Peking University

2023 Best Poster Prize, JFM/FLOW Symposium China 2023

2022 Dean's Scholarship, Peking University

2022 The China Optics Valley Scholarship, Peking University

2020 Excellent Report Prize, 1st National Forum for Doctoral Students in Mechanics

2019 Excellent Graduate, HUST

2017 Top 1% Undergraduate, HUST

2016 American Bureau of Shipping Scholarship, HUST

2016 First Prize, 5th China Marine Vehicle Design and Construction Competition

Teaching Experience

Peking University Engineering Mathematics
Spring 2022, Spring 2023 (Teaching Assistant)