Jiaxuan Li

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Profile

Ph. D. candidate with an educational background in fluid mechanics from University of Science and Technology of China (USTC). My current research focuses on theoretical and experimental investigations into Richtmyer-Meshkov instability (RMI). I have proposed a new method of forming interfaces for studies of shock–interface interaction by using a super-hydrophobic–oleophobic surface to constrain the soap film. I am experienced in investigating the effects of compressibility, mode coupling, and convergent geometry on RMI at a heavy/light interface.

Education

(2023 autumn - 2026 spring)

Ph. D. Candidate in Fluid Mechanics :
Specialization: RMI - Focus on analytical and experimental investigations on RMI at a heavy/light interface.
Location: USTC
Supervisor: Prof. Xisheng Luo & Prof. Zhigang Zhai
Conversion from Master to Ph. D.

(2021 autumn - 2023 spring)

Master in Fluid Mechanics :
Specialization: RMI - Focus on interface formation method.
Specialized basic courses: (Average score: 95.00)
Non-viscous Flow and Shock waves, Advanced Applied Mathematics, Computational Fluid Mechanics, Advanced Fluid Mechanics
GPA: 4.00/4.30 ($^{47}/_{45}$ credits)
Location: USTC

(2017 autumn - 2021 spring)

Bachelor in Theoretical and Applied Mechanics:
GPA: 3.62/4.30 ($^{170.5}/_{160}$ credits)
Location: USTC

Work experience

(2024 October - 2025 May)

Research Administrative Assistant:
Working on RMI induced by a sinusoidal perturbed shock through theoretical modelling and numerical simulations.
Location: Hong Kong Polytechnic University

(2019 autumn - 2020 spring)

Teaching Assistant:
Elementary Fluid Mechanics
Fundamentals of Gasdynamics (EN) **(Outstanding TA Award)**
Location: USTC

Languages

- Chinese: Primary language
- English: Secondary language, fluent

Publications

Articles:

1. **Jiaxuan Li**, Qing Cao, He Wang, Zhigang Zhai, Xisheng Luo. New interface formation method for shock–interface interaction studies, *Exp. Fluids*, 64(11): 170, 2023. http://www.doi.org/10.1007/s00348-023-03710-y
2. **Jiaxuan Li**, Chenren Chen, Zhigang Zhai, Xisheng Luo. Asymptotic matching modal theory and experiments on Richtmyer-Meshkov instability. *J. Fluid Mech.*, 1002, A16, 2025. http://www.doi.org/10.1017/jfm.2024.1125
3. **Jiaxuan Li**, He Wang, Zhigang Zhai, Xisheng Luo. Richtmyer–Meshkov instability of a single-mode heavy–light interface in cylindrical geometry, *Phys. Fluids*, 35, 106112, 2023. http://www.doi.org/10.1063/5.0207779
4. **Jiaxuan Li**, Chenren Chen, Zhigang Zhai, Xisheng Luo. Effects of compressibility on Richtmyer-Meshkov instability of heavy/light interface. *Phys. Fluids*, 36, 056104, 2024. http://www.doi.org/10.1063/5.0167248
5. Qing Cao, **Jiaxuan Li**, He Wang, Zhigang Zhai, Xisheng Luo. Coupled Richtmyer–Meshkov and Kelvin–Helmholtz instability on a shock-accelerated inclined single-mode interface, *J. Fluid. Mech.*, 996, A37, 2024. http://www.doi.org/10.1017/jfm.2024.710
6. Chenren Chen, **Jiaxuan Li**, He Wang, Zhigang Zhai, Xisheng Luo. Effects of disturbed transmitted shock and interface coupling on heavy gas layer evolution, *Phys. Fluids*, 36, 086108, 2024. http://www.doi.org/10.1063/5.0215839
7. Chenren Chen, **Jiaxuan Li**, He Wang, Zhigang Zhai, and Xisheng Luo. Attenuation of Richtmyer-Meshkov instability growth of fluid layer via double shock, *Sci. China-Phys. Mech. Astron.* 68, 244711, 2025. http://www.doi.org/10.1007/s11433-024-2592-5
8. Yinuo Xing, Chenren Chen, **Jiaxuan Li**, He Wang, Zhigang Zhai, and Xisheng Luo. Atwood-number dependence of the Richtmyer-Meshkov instability at a heavy-light single-mode interface, *J. Fluid. Mech.* 1007, A54, 2025 http://dx.doi.org/10.1017/jfm.2025.107
9. **Jiaxuan Li**, Zhigang Zhai. Modelling and mechanism of non-standard Richtmyer-Meshkov instability, *J. Fluid Mech.*, (Major Revision)

Conferences:

1. **Jiaxuan Li**, He Wang, Zhigang Zhai, Xisheng Luo. Convergent Richtmyer-Meshkov instability on a heavy/light interface. The 34th International Symposium on Shock Waves, 2023, Korea.
2. **Jiaxuan Li**, Chenren Chen, Zhigang Zhai, Xisheng Luo. On mode coupling of RM instability at a heavy/light interface. The 21st Chinese National Conference on Shock Waves and Shock Tubes, 2024, Taiyuan, Shanxi, China. **(Excellent paper award)**
3. **Jiaxuan Li**, Zhigang Zhai, Chih-yung Wen, Xisheng Luo. Analytical and numerical investigations on non-standard RMI attenuation at a hravy/light interface. The 35th International Symposium on Shock Waves, 2025, Australia.

Other Skills

Skilled operation of common office software;
Skilled application of scientific computing software such as Matlab, Mathematica;
Skilled use of Origin, Tecplot and other data processing software; operation of LaTeX;
Skilled in schlieren and shock tube experiments.