

# Hao Ran (冉豪)

PhD Candidate in Space Physics

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## EDUCATION

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- 2024.09 - present    Ph.D. Student in Space Plasma Physics at **Mullard Space Science Laboratory, Department of Climate and Space Physics, University College London**  
Supervisor: Prof. Daniel Verscharen
- 2021.09 - 2024.06    Master's Degree in Space Physics at **National Space Science Center, CAS & University of Chinese Academy of Sciences**  
Supervisor: Prof. Ying Liu
- 2017.09 - 2021.06    Bachelor's Degree in Astronomy at **School of Astronomy and Space Science, Nanjing University**  
Supervisor: Prof. Yang Guo

## RESEARCH INTERESTS

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- Solar wind; kinetic space plasma physics; interplanetary magnetic field; space weather.
- Solar flares; coronal mass ejections; filaments; active regions.
- Statistical, observational, and machine-learning methods in heliophysics and space science.

## SELECTED TALKS

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- **Invited Talk, Kiel University** 2025.10
  - *Kinetic Signatures of Ion-acoustic Instabilities in the Solar Wind: Measurements from Solar Orbiter*
  - Kiel, Germany
- **Invited Talk, National Space Science Center (CAS)** 2025.09
  - *The Damping and Instability of Ion-Acoustic Waves in the Solar Wind: Solar Orbiter Measurements*
  - Beijing, China
- **In Situ Heliospheric Science Meeting** 2025.05
  - *A Pipeline for Separating Solar Orbiter Proton Alpha-particle Sensor (PAS) Measurements*
  - Lyon, France
- **1st ASO-S and CHASE Joint Conference** 2023.10
  - *The Alpha-Proton Differential Flow in the Alfvénic Young Solar Wind: From Sub-Alfvénic to Super-Alfvénic*
  - Wuxi, Jiangsu, China
- **20th National Solar-Terrestrial Space Science Seminar** 2023.04
  - *Relationship between Successive Flares in the Same Active Region and SHARP Parameters*
  - Fuzhou, Fujian, China

## AWARDS AND HONORS

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2024.04	STFC Studentship	UK Research and Innovation
2024.04	UCL's International Scholar Awards for Doctoral Training Centers	University College London
2023.10	National Scholarship for Graduate Students	Chinese Academy of Sciences
2023.04	Excellent Paper for Young Researchers (4/57)	20th National Solar-Terrestrial Space Science Seminar
2021.09	The Undergraduates' Scholarship	National Space Science Center, Chinese Academy of Sciences
2019.04	The People's Scholarship in China	Nanjing University

## SKILLS

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Language      Mandarin Chinese (Native); English (Fluent)  
Programming   Python (proficient), IDL, C, C++, Fortran, R, MATLAB, L<sup>A</sup>T<sub>E</sub>X

## REFERENCE

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- **Prof. Daniel Verscharen**  
Mullard Space Science Laboratory, University College London;  
Holmbury Hill Road, Dorking, RH5 6NT, United Kingdom;  
d.verscharen@ucl.ac.uk
- **Prof. Ying Liu**  
State Key Laboratory of Space Weather, National Space Science Center, CAS;  
No.1 Nanertiao Road, Zhongguancun, Haidian District, Beijing 100190, China;  
liuxying@swl.ac.cn
- **Prof. Yang Guo**  
School of Astronomy and Space Science, Nanjing University;  
No.163 Xianlin Road, Qixia District, Nanjing 210023, China;  
guoyang@nju.edu.cn

## MISCELLANY

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1. **Volunteer teaching in rural areas.** (Guizhou & Sichuan) 2018.07 & 2019.07
  - Responsible for the *Introduction to Astronomy* Course.
  - Obtained the "*Most Welcomed Teacher*" award (which I am really proud of).
2. **Amateur soccer player.** (Nanjing University) 2017.09 - 2021-06
  - Second place in the Nanjing University Champions League. (Season 2018-2019)
  - First place in the Nanjing University Champions Cup. (Season 2017-2018)

### As first author:

- [1] **Hao Ran**, Ying D. Liu, Yang Guo, and Rui Wang. “Relationship between Successive Flares in the Same Active Region and SHARP parameters”. In: *The Astrophysical Journal* 937.1 (Sept. 2022), p. 43. URL: <https://iopscience.iop.org/article/10.3847/1538-4357/ac80fa>.
- [2] **Hao Ran**, Ying D. Liu, Chong Chen, and Parisa Mostafavi. “The Alpha-Proton Differential Flow in the Alfvénic Young Solar Wind: From Sub-Alfvénic to Super-Alfvénic”. In: *the Astrophysical Journal* 963 (Feb. 2024), p. 82. URL: <https://doi.org/10.3847/1538-4357/ad2069>.
- [3] **Ran, Hao**, Daniel Verschcaren, Jesse Coburn, Georgios Nicolaou, Charalambos Ioannou, Xiangyu Wu, Jingying Liu, Kristopher Klein, and Christopher Owen. “The Damping and Instability of Ion-acoustic Wave in the Solar Wind: Solar Orbiter Observations”. In: *The Astrophysical Journal* (submitted).

### As significant-contributing author:

- [1] Ying D. Liu, **Hao Ran**, Huidong Hu, and Stuart D. Bale. “On the Generation and Evolution of Switchbacks and the Morphology of the Alfvénic Transition: Low Mach-number Boundary Layers”. In: *The Astrophysical Journal* 944.2 (Feb. 2023), p. 116. DOI: [10.3847/1538-4357/acb345](https://doi.org/10.3847/1538-4357/acb345). URL: <https://dx.doi.org/10.3847/1538-4357/acb345>.
- [2] Ying D. Liu, Bei Zhu, **Hao Ran**, Huidong Hu, Mingzhe Liu, Xiaowei Zhao, Rui Wang, Michael L. Stevens, and Stuart D. Bale. “Direct In Situ Measurements of a Fast Coronal Mass Ejection and Associated Structures in the Corona”. In: *the Astrophysical Journal* 963 (Feb. 2024), p. 85. URL: <https://doi.org/10.3847/1538-4357/ad1e56>.

### Other co-authored papers:

- [1] Wenshuai Cheng, Ying D. Liu, **Hao Ran**, Yiming Jiao, Michael L. Stevens, and Justin C. Kasper. “Origin and Properties of the Near Subsonic Solar Wind Observed by Parker SolarProbe”. In: *the Astrophysical Journal* 967 (Apr. 2024), p. 58. URL: <https://iopscience.iop.org/article/10.3847/1538-4357/ad3b98>.
- [2] Yiming Jiao, Ying D Liu, Wenshuai Cheng, **Ran, Hao**, and Rui Wang. “On the Acceleration of the Young Solar Wind from Different Source Regions”. In: *The Astrophysical Journal Letters* 975.2 (2024), p. L41. URL: <https://iopscience.iop.org/article/10.3847/2041-8213/ad85ea>.
- [3] Yiming Jiao, Ying D. Liu, **Ran, Hao**, and Wenshuai Cheng. “Properties of Steady Sub-Alfvénic Solar Wind in Comparison with Super-Alfvénic Wind from Parker Solar Probe Measurements”. en. In: *The Astrophysical Journal* 960.1 (Jan. 2024), p. 42. DOI: [10.3847/1538-4357/ad0dfe](https://doi.org/10.3847/1538-4357/ad0dfe). URL: <https://iopscience.iop.org/article/10.3847/1538-4357/ad0dfe>.
- [4] Wenshuai Cheng, Ming Xiong, Yiming Jiao, **Ran, Hao**, Liping Yang, Huidong Hu, and Rui Wang. “Inertial-range Turbulence Anisotropy of the Young Solar Wind from Different Source Regions”. In: *The Astrophysical Journal Letters* 988.1 (July 2025), p. L15. URL: <https://iopscience.iop.org/article/10.3847/2041-8213/adeb8a>.