

Hao Ran

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RESEARCH INTERESTS

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

EDUCATION

- 2024.09 - present Ph.D. Student in Space 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

SCIENTIFIC TALKS

- 2025.05 **In situ Heliospheric science meeting**
- *A Pipeline for Separating Solar Orbiter Proton Alpha-particle Sensor (PAS) Measurements*
- Lyon, France
- 2025.04 **Spring Magnetosphere, Ionosphere, and Solar-Terrestrial (MIST) 2025**
- *Using GMM to Separate Ion Components in PAS Measurements*
- Leicester, United Kingdom
- 2024.11 **Autumn Magnetosphere, Ionosphere, and Solar-Terrestrial (MIST) 2024**
The Alpha Drift in the Young Solar Wind measured by Parker Solar Probe
- Birmingham, United Kingdom
- 2023.12 **Graduate Research for National Service Symposium in Space Physics**
- *The Alpha-Proton Differential Flow in the near-Sun Solar Wind*
- Peking University, Beijing, China
- 2023.10 **1st ASO-S and CHASE Joint Conference**
- *The Alpha-Proton Differential Flow in the Alfvénic Young Solar Wind: From Sub-Alfvénic to Super-Alfvénic*
- Wuxi, Jiangsu Province, China.
- 2023.05 **"Waves of Science" Seminar of NSSC**
- *How I Developed the Idea for my First Paper*
- NSSC, Beijing, China
- 2023.04 **20th National Solar-Terrestrial Space Science Seminar**
- *Relationship between Successive Flares in the Same Active Regions and SHARP Parameters*
- Fuzhou, Fujian Province, China.

AWARDS AND HONORS

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

Language Mandarin Chinese (Native); English (Fluent)
Programming Python (proficient), IDL, C, C++, Fortran, R, MATLAB, \LaTeX

REFERENCE

- **Prof. Daniel Verscharen**
Mullard Space Science Laboratory, University College London;
Holmbury Hill Rd, Dorking, RH5 6NT, United Kingdom;
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- **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

PEER-REVIEWED PUBLICATIONS

As first author:

- Hao Ran**, Ying D. Liu, Yang Guo, and Rui Wang (Sept. 2022). "Relationship between Successive Flares in the Same Active Region and SHARP parameters". In: *The Astrophysical Journal* 937.1, p. 43. URL: <https://iopscience.iop.org/article/10.3847/1538-4357/ac80fa>.
- Hao Ran**, Ying D. Liu, Chong Chen, and Parisa Mostafavi (Feb. 2024). "The Alpha-Proton Differential Flow in the Alfvénic Young Solar Wind: From Sub-Alfvénic to Super-Alfvénic". In: *the Astrophysical Journal* 963, p. 82. URL: <https://doi.org/10.3847/1538-4357/ad2069>.

As significant-contributing author:

- Liu, Ying D., **Hao Ran**, Huidong Hu, and Stuart D. Bale (Feb. 2023). "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, 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>.
- Liu, Ying D., Bei Zhu, **Hao Ran**, Huidong Hu, Mingzhe Liu, Xiaowei Zhao, Rui Wang, Michael L. Stevens, and Stuart D. Bale (Feb. 2024). "Direct In Situ Measurements of a Fast Coronal Mass Ejection

and Associated Structures in the Corona”. In: *the Astrophysical Journal* 963, p. 85. URL: <https://doi.org/10.3847/1538-4357/ad1e56>.

Other co-authored papers:

Cheng, Wenshuai, Ying D. Liu, **Hao Ran**, Yiming Jiao, Michael L. Stevens, and Justin C. Kasper (Apr. 2024). “Origin and Properties of the Near Subsonic Solar Wind Observed by Parker SolarProbe”. In: *the Astrophysical Journal* 967, p. 58. URL: <https://iopscience.iop.org/article/10.3847/1538-4357/ad3b98>.

Jiao, Yiming, Ying D Liu, Wenshuai Cheng, **Ran, Hao**, and Rui Wang (2024a). “On the Acceleration of the Young Solar Wind from Different Source Regions”. In: *The Astrophysical Journal Letters* 975.2, p. L41. URL: <https://iopscience.iop.org/article/10.3847/2041-8213/ad85ea>.

Jiao, Yiming, Ying D. Liu, **Ran, Hao**, and Wenshuai Cheng (Jan. 2024b). “Properties of Steady Sub-Alfvénic Solar Wind in Comparison with Super-Alfvénic Wind from Parker Solar Probe Measurements”. In: *The Astrophysical Journal* 960.1, 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>.

Cheng, Wenshuai, Ming Xiong, Yiming Jiao, **Ran, Hao**, Liping Yang, Huidong Hu, and Rui Wang (July 2025). “Inertial-range Turbulence Anisotropy of the Young Solar Wind from Different Source Regions”. In: *The Astrophysical Journal Letters* 988.1, p. L15. URL: <https://iopscience.iop.org/article/10.3847/2041-8213/adeb8a>.

OUTRESEARCH EXPERIENCE

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.
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)