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595 Charles E Young Dr.
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Chen Shi
Curriculum Vitae

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Dr. Chen Shi is an assistant researcher working at Department of Earth, Planetary, and Space Sciences of UCLA. His research interests include *onset and evolution of fast magnetic reconnection*, *theory of solar wind turbulence*, and *heating and acceleration of solar corona and solar wind*. His work includes developing magnetohydrodynamic (MHD) theories, building and running parallelized MHD simulation programs, and analysis of satellite (Parker Solar Probe, WIND, etc.) data.

Employment

Assistant Researcher, *Department of Earth, Planetary, and Space Sciences, UCLA, Los Angeles, CA* April 2023 — Present
Postdoctoral Researcher, *Department of Earth, Planetary, and Space Sciences, UCLA, Los Angeles, CA* July 2020 — March 2023

Education

Ph.D. in Geophysics and Space Physics, *University of California, Los Angeles, Los Angeles, CA* June 2020
Thesis title: *Magnetic Reconnection and Turbulence in the Inner Heliosphere*
B.S. in Space Science & Technology with honors, *Peking University, Beijing, China* July 2015

Skills

Programming Expert at **C/C++, Fortran, Python, IDL, Parallel computing (MPI, OpenMP, Pthreads)**; familiar with **MATLAB, MATHEMATICA**
Communication Mandarin, English & Japanese

Awards and Fellowships

Vincenzo Ferraro Award for best PhD thesis 2021
***Physics of Plasmas* Early Career Collection 2022** 2022
EPSS department fellowship, *University of California, Los Angeles* 2015
Outstanding College Student of Beijing, *Bureau of Education of Beijing* 2014
First place of Henan Province, *Chinese Physics Olympiad* 2010

Funds

NASA Early Career Investigator Program #80NSSC23K1064, PI, *Properties and origins of magnetic switchbacks and switchback patches in the solar wind* 2023-2027
NSF SHINE #2229566, PI, *Structures in the solar corona and solar wind and their interaction with the turbulence* 2022-2025
NSF GEM #2247758, Co-I, *How Upstream Solar Wind Conditions Determine the Properties of the Foreshock Backstreaming Ions* 2023-2026
NSF ACCESS Allocation, PI, *3D MHD Simulations of Magnetic Reconnection and Turbulence in the Heliosphere* 2020-2023

Media Reports

San Diego Supercomputer Center News Releases, *UCLA researchers use UC San Diego-based resource to simulate solar wind behavior, Kimberly Mann Bruch* 2021

Activities & Outreaches

- Served as a panelist for proposal review panels of NSF and NASA
- Convener of AGU fall meeting Session: *Fundamental Physics of the Solar Corona and Inner Heliosphere* 2022-2023
- Served as reviewer for multiple journals including *Journal of Geophysical Research: Space Physics, Astronomy & Astrophysics, etc.*
- Host space physics seminar at UCLA 2023
- Served as judge for *Outstanding Student Presentation Awards* program in AGU Fall meetings
- ***Booth: Our Magnetic Sun***, EXPLORE YOUR UNIVERSE outreach event, UCLA 2020, 2022, 2023
- ***Booth: Our Exciting Sun***, EXPLORE YOUR UNIVERSE outreach event, UCLA 2018

Teaching Experience

- Organize and co-host UCLA *Space Physics Journal Club* Fall 2023
- Co-lecturer of UCLA graduate course *EPSS 298: Particle-in-Cell and MHD simulations* Spring 2023
- Co-lecturer of UCLA graduate course *EPSS 298: MHD Turbulence and Magnetic reconnection* Spring 2022
- Invited guest lecture on *Resistive tearing mode instability and magnetic reconnection*, October 28, 2021 and October 26, 2022, University of Science and Technology of China
- Student day tutorial talk: *MHD waves and turbulence in the expanding solar wind*, SHINE Conference, 2019, Boulder, Colorado

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- Teaching assistant & lab instructor, *Oceanography*, 2016 spring quarter, UCLA
- Instruct PhD and undergraduate students to conduct scientific research

Oral Presentations

- Magnetic switchbacks: current understanding and outlook, *Space Physics Seminar of UCLA*, Sep 29, 2023
- Can coronal jets produce switchbacks?, *International Space Science Institute: Magnetic Switchbacks in the Young Solar Wind*, 2023
- Turbulence and large-scale structures in the expanding solar wind, *SHINE workshop*, ***invited scene-setting talk***, 2022
- Alfvén wave as a power source of the solar wind: energy and momentum deposition and evolution of switchbacks, *SHINE workshop*, ***invited scene-setting talk***, 2022
- Patches of magnetic switchbacks and their origins, *Parker Two*, 2022
- Patches of the magnetic switchbacks: hints of their origins, *AGU Fall Meeting*, ***invited***, 2021
- Ion and electron temperatures in the solar wind and their correlations with the solar wind speed, *AGU Fall Meeting*, 2021
- Evolution of MHD turbulence in the solar wind: Parker Solar Probe observations and numerical simulations, *Space Plasma Seminar, Space Research Institute of the Russian Academy of Sciences*, Nov 1, 2021
- Evolution of MHD turbulence in the solar wind: Parker Solar Probe observations and numerical simulations, *Space Physics Seminar of UCLA*, Oct 1, 2021
- Stability of the magnetotail current sheet with normal magnetic field and field-aligned plasma flows, *Space Plasma Seminar, Space Research Institute of the Russian Academy of Sciences*, Jun 7, 2021
- Large-scale structures and their effects on the evolution of solar wind turbulence, *High Altitude Observatory (HAO) Colloquium*, Boulder, Colorado, Jan 15, 2020
- MHD Turbulence in the Solar Wind: Observations from First Five Encounters of Parker Solar Probe, *AGU Fall Meeting*, 2020
- Propagation of Alfvén waves and evolution of turbulence in the expanding solar wind with the presence of stream interaction, *AGU Fall Meeting*, 2019
- Onset and nonlinear evolution of fast reconnection: Lundquist number and Hall effects, *AOGS 15th Annual Meeting*, 2018

Publications

1. **Shi, C.**, Sioulas, N., Huang, Z. et al. Evolution of MHD turbulence in the expanding solar wind: residual energy and intermittency (2023). *arXiv:2308.12376*.
2. **Shi, C.**, Velli, M., Lionello, R. et al. Proton and electron temperatures in the solar wind and their correlations with the solar wind speed (2023). *The Astrophysical Journal*, 944, 82.
3. **Shi, C.**, Velli, M., Bale, S. D. et al. Acceleration of polytropic solar wind: Parker Solar Probe observation and one-dimensional model (2022). *Physics of Plasmas*, 29, 12.
4. **Shi, C.**, Panasenco, O., Velli, M. et al. Patches of magnetic switchbacks and their origins (2022). *The Astrophysical Journal*, 934, 152.
5. **Shi, C.** Instabilities in a current sheet with plasma jet (2022). *Journal of Plasma Physics*, 88, 4.
6. **Shi, C.**, Velli, M., Tenerani, A. et al. Influence of the heliospheric current sheet on the evolution of solar wind turbulence (2022). *The Astrophysical Journal*, 928, 93.
7. **Shi, C.**, Artemyev, A., Velli, M. et al. Stability of the magnetotail current sheet with normal magnetic field and field-aligned plasma flows (2021). *Journal of Geophysical Research: Space Physics*, 126, 11, e2021JA029711.
8. **Shi, C.**, Velli, M., Panasenco, O., et al. Alfvénic versus non-Alfvénic turbulence in the inner heliosphere as observed by Parker Solar Probe (2021). *Astronomy & Astrophysics*, 650, A21.
9. **Shi, C.**, Velli, M., Pucci, F., et al. Oblique Tearing Mode Instability: Guide Field and Hall Effect (2020). *The Astrophysical Journal*, 902, 2.
10. **Shi, C.**, Velli, M., Tenerani, A., et al. Propagation of Alfvén waves in the expanding solar wind with the fast-slow stream interaction (2020). *The Astrophysical Journal*, 888, 2.
11. **Shi, C.**, Tenerani, A., Velli, M., et al. Fast recursive reconnection and the Hall effect: Hall-MHD simulations (2019). *The Astrophysical Journal*, 883, 2.
12. **Shi, C.**, Velli, M., & Tenerani, A. Marginal stability of Sweet–Parker type current sheets at low Lundquist numbers (2018). *The Astrophysical Journal*, 859, 2.
13. Telloni, D., Romoli, M., Velli, M., et al. Coronal Heating Rate in the Slow Solar Wind (2023). *The Astrophysical Journal Letters*, 955, L4
14. Telloni, D., Romoli, M., Velli, M., et al. Energy Budget in the Solar Corona (2023). *The Astrophysical Journal*, 954, 108

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15. Sioulas, N., Velli, M., Huang, Z., et al. On the Evolution of the Anisotropic Scaling of Magnetohydrodynamic Turbulence in the Inner Heliosphere (2023). *The Astrophysical Journal*, 951, 141
16. Huang, Z., Sioulas, N., Shi, C., et al. New Observations of Solar Wind 1/f Turbulence Spectrum from Parker Solar Probe (2023). *The Astrophysical Journal Letters*, 950, L8
17. Tenerani, A., González, C., Sioulas, N., et al. Dispersive and kinetic effects on kinked Alfvén wave packets: A comparative study with fluid and hybrid models (2023). *Physics of Plasmas*, 30, 3
18. Raouafi, N., Matteini, L., Squire, J., et al. Parker Solar Probe: Four Years of Discoveries at Solar Cycle Minimum (2023). *Space Science Reviews*, 219, 8.
19. Sioulas, N., Huang, Z., Shi, C., et al. Magnetic field spectral evolution in the inner heliosphere (2023). *The Astrophysical Journal Letters*, 943, L8.
20. Artemyev, A., Shi, C., Lin, Y., et al. Ion Kinetics of Plasma Flows: Earth's Magnetosheath versus Solar Wind (2022). *The Astrophysical Journal*, 939, 85.
21. Sioulas, N., Shi, C., Huang, Z., et al. Preferential Heating of Protons over Electrons from Coherent Structures during the First Perihelion of the Parker Solar Probe (2022). *The Astrophysical Journal Letters*, 935, L29.
22. Huang, Z., Shi, C., Sioulas, N., et al. Conservation of Total Wave Action in the Expanding Solar Wind (2022). *The Astrophysical Journal*, 935, 60.
23. Telloni, D., Adhikari, L., Zank, G., et al. Observation and Modeling of the Solar Wind Turbulence Evolution in the Sub-Mercury Inner Heliosphere (2022). *The Astrophysical Journal Letters*, 938, L8.
24. Sioulas, N., Huang, Z., Velli, M., et al. Magnetic Field Intermittency in the Solar Wind: Parker Solar Probe and SolO Observations Ranging from the Alfvén Region up to 1 AU (2022). *The Astrophysical Journal*, 934, 143.
25. Sioulas, N., Velli, M., Chhiber, R., et al. Statistical analysis of intermittency and its association with proton heating in the near Sun environment (2022). *The Astrophysical Journal*, 927, 140.
26. Réville, V., Fargette, N., Rouillard, A. P., et al. Flux rope and dynamics of the heliospheric current sheet: Study of the Parker Solar Probe and Solar Orbiter conjunction of June 2020 (2022). *Astronomy & Astrophysics*, 659, A110.
27. Tenerani, A., Sioulas, N., Matteini, L., et al. Evolution of Switchbacks in the Inner Heliosphere (2021). *The Astrophysical Journal Letters*, 919, L31.
28. Telloni, D., Sorriso-Valvo, L., Woodham, L. D., et al. Evolution of Solar Wind Turbulence from 0.1 to 1 au during the First Parker Solar Probe–Solar Orbiter Radial Alignment (2021). *The Astrophysical Journal Letters*, 912, L21.
29. Réville, V., Velli, M., Rouillard, A. P., et al. Tearing Instability and Periodic Density Perturbations in the Slow Solar Wind (2020). *The Astrophysical Journal Letters*, 895, L20.
30. Pucci, F., Velli, M., Shi, C., et al. Onset of fast magnetic reconnection and particle energization in laboratory and space plasmas (2020). *Journal of Plasma Physics*, 86(6), 535860601.
31. Réville, V., Velli, M., Panasenco, O., et al. The role of Alfvén wave dynamics on the large scale properties of the solar wind: comparing a MHD simulation with PSP E1 data (2020). *The Astrophysical Journal Supplement Series*, 246, 2.
32. Tenerani, A., Velli, M., Matteini, L., et al. Magnetic field kinks and folds in the solar wind (2020). *The Astrophysical Journal Supplement Series*, 246, 2.
33. Panasenco, O., Velli, M., D'Amicis, R., et al. Exploring Solar Wind Origins and Connecting Plasma Flows from the Parker Solar Probe to 1 au: Nonspherical Source Surface and Alfvénic Fluctuations (2020). *The Astrophysical Journal Supplement Series*, 246, 2.
34. Liu, H., Zong, Q.-G., Zhang, H., et al. The geometry of an electron scale magnetic cavity in the plasma sheet (2019). *Geophysical Research Letters*, 46, 16.
35. Lu, S., Angelopoulos, V., Artemyev, A. V., et al. Turbulence and particle acceleration in collisionless magnetic reconnection: effects of temperature inhomogeneity across pre-reconnection current sheet (2019). *The Astrophysical Journal*, 878, 2,