

## Curriculum Vitae

### Dr. Bingbing Wang

Research Scientist

Center for Space Plasma and Aeronomic Research

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#### RESEARCH EXPERIENCE

2023/12 - present    Research Scientist

Center of Space Plasma and Aeronomic Research, Department of Space Science,  
University of Alabama in Huntsville

2021/05 - 2023/12    Postdoctoral Research Assistant

Center of Space Plasma and Aeronomic Research, University of Alabama in Huntsville  
supervisor: Prof. Gary Zank

2020/01 - 2021/05    visiting scholar

Center of Space Plasma and Aeronomic Research, University of Alabama in Huntsville  
supervisor: Prof. Gary Zank

#### EDUCATION

2019/01 - 2019/10    visitor

Department of Astronomy, University of Wisconsin-Madison

2014/09 - 2019/12    Institute of High Energy Physics of the Chinese Academy of  
Sciences, Beijing, China, **Ph.D.** in particle astrophysics.

2010/09 - 2014/06    Shaanxi Normal University, Xi'an, Shaanxi, China, **B.S.** in physics.

#### RESEARCH INTERESTS

The goal of my academic career is to better understand some fundamental physics processes about the propagation and acceleration of energetic particles in both the heliosphere and the Milky way. Broadly speaking, these include magnetized turbulence, shocks, cosmic rays, solar energetic particles, and energetic neutral atoms. My research is based on theoretical development and numerical calculations. To be more specific, part of my recent research activities are summarized below.

- ❑ Refine MHD turbulence transport model and apply the model to investigate the distribution of turbulence both in the heliosphere and the interstellar medium
- ❑ Combine the nonlinear diffusion theory and measured turbulence power spectrum to study the acceleration and transport of energetic particles in the heliosphere and galaxy
- ❑ Apply acceleration theories to the pickup ions and investigate the origin of energetic neutral atoms observed by IBEX and future IMAP experiments.

## MEMBERSHIP

- Member of AGU (American Geophysics Union) 2022-present
- Member of APS (American Physics Society), 2023

## JOURNAL ARTICLES

- [1] **Wang, B.B.**, Zhao, L.L., Abouhamzeh, P., Zank, G.P. and Adhikari, L. (2023). The temporal and latitudinal dependence of turbulence driven by pickup ions in the outer heliosphere. *Frontiers in Astronomy and Space Sciences*, 10, p.1298577.
- [2] **Wang, B.B.**, Zank, G. P., Shrestha, B. L., Kornbleuth, M., & Opher, M. (2023). Relating Energetic Ion Spectra to Energetic Neutral Atoms. *The Astrophysical Journal*, 944(2), 198.
- [3] **Wang, B. B.**, Zank, G. P., Zhao, L. L., & Adhikari, L. (2022). Turbulent Cosmic Ray–Mediated Shocks in the Hot Ionized Interstellar Medium. *The Astrophysical Journal*, 932(1), 65.
- [4] **Wang, B. B.**, Zank, G. P., Adhikari, L., & Zhao, L. L. (2022). On the Conservation of Turbulence Energy in Turbulence Transport Models. *The Astrophysical Journal*, 928(2), 176.
- [5] **Wang, B. B.**, Bi, X. J., Fang, K., Lin, S. J., & Yin, P. F. (2022). Solar modulation of cosmic proton and helium with AMS-02. *Physical Review D*, 106(6), 063006.
- [6] **Wang, B. B.**, Bi, X. J., Fang, K., Lin, S. J., & Yin, P. F. (2019). Time-dependent solar modulation of cosmic rays from solar minimum to solar maximum, *Physical Review D*. 100, 063006.
- [7] **Wang, B. B.**, Bi, X. J., Lin, S. J., & Yin, P. F. (2018). Explanations of the DAMPE high energy electron/positron spectrum in the dark matter annihilation and pulsar scenarios. *SCIENCE CHINA Physics, Mechanics & Astronomy*, 61(10), 101004.
- [8] Guo, J.N., **Wang, B.B.**, Whitman, K., Plainaki, C, Zhao, L.L., Bain. M. H., ... & Zheng Y.H. (2023). Particle Radiation Environment in the Heliosphere: Status, limitations and recommendations. *Advances in Space Research*.

- [9] Fang, K., **Wang, B. B.**, Bi, X. J., Lin, S. J., & Yin, P. F. (2017). Perspective on the cosmic-ray electron spectrum above TeV. *The Astrophysical Journal*, 836(2), 172.
- [10] Adhikari, L., Zank, G.P., **Wang, B.B.**, Zhao, L.L., Telloni, D., Pitna, A., Opher, M., Shrestha, B., McComas, D.J. and Nykyri, K., 2023. Theory and Transport of Nearly Incompressible Magnetohydrodynamic Turbulence: High Plasma Beta Regime. *The Astrophysical Journal*, 953(1), p.44.
- [11] Opher, M., Richardson, J., Zank, G. P., Florinski, V., Giacalone, J., Sokół, J. M., ... **Wang, B.B.** & Boldon, A. (2023). Solar wind with Hydrogen Ion charge Exchange and Large-Scale Dynamics (SHIELD) DRIVE Science Center. *Frontiers in Astronomy and Space Sciences*, 10, 1143909.
- [12] Kornbleuth, M., Opher, M., Zank, G. P., **Wang, B. B.**, Giacalone, J., Gkioulidou, M., & Dialynas, K. (2023). An Anomalous Cosmic-Ray Mediated Termination Shock: Implications for Energetic Neutral Atoms. *The Astrophysical Journal Letters*, 944(2), L47.
- [13] Kornbleuth, M., Opher, M., Dialynas, K., Zank, G. P., **Wang, B. B.**, Baliukin, I., ... & Dayeh, M. A. (2023). Probing the Length of the Heliospheric Tail with Energetic Neutral Atoms (ENAs) from 0.52 to 80 keV. *The Astrophysical Journal Letters*, 945(1), L15.
- [14] Liu, W., Bi, X. J., Lin, S. J., **Wang, B. B.**, & Yin, P. F. (2017). Excesses of cosmic ray spectra from a single nearby source. *Physical Review D*, 96(2), 023006.

#### SELECTED PRESENTATIONS

“Analytical solutions of turbulence energy in the turbulence transport models”, 65th Annual Meeting of the APS Division of Plasma Physics, Denver, CO, October 30-November 3, 2023

“Relating the Origin of Energetic Ions to Energetic Neutral Atoms (ENAs)”, 2022 AGU Fall Meeting, Chicago, IL. December 12-16, 2022.

“Turbulent Cosmic Ray–Mediated Shocks in the Hot Ionized Interstellar Medium”, 20th Annual International Astrophysics Conference, Santa Fe, NM, October 31–November 4, 2022, Invited.

“Cosmic ray modified supernova remnant shock”, Annual Gaseous Electronics Conference, Online, October 4-8 2021

#### ACADEMIC SERVICE

Referee for the scientific journal *The Astrophysics Journal*, and *Physics Review D*

Member of SHIELD NASA DRIVE Center 2022-present

Lecturer for the International Space Weather Camp, Huntsville, AL, 2023

Mentor of Regional Introduction to Plasma Processes (RIPP) program, Huntsville, AL, 2024