

Jiawei Gao, Postdoctoral Researcher

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Employment History

- 2025 – now 📌 **Postdoctoral researcher**, Center for Space Physics, Boston university
- 2022 – 2025 📌 **Postdoctoral researcher**, Institute of geology and geophysics, Chinese Academy of Sciences

Education

- 2016 – 2022 📌 **Ph.D, Institute of Geology and Geophysics, Chinese Academy of Sciences** Space physics. Supervisor: Dr. Zhaojin Rong and Dr. Yong Wei
Thesis title: *A crustal magnetic field model of Mars*
- 2012 – 2016 📌 **B.Sc. China University of Geosciences (Wuhan)** Geophysics.
Thesis title: *Current sheet flapping motion in the Earth's magnetotail.*

Research Publications

Journal Articles

- 1 **Gao, J.**, Dong, C., Luhmann, J., Bougher, S., & Zhang, C. (2026). New insights into the current systems in the venusian induced magnetosphere. *Journal of Geophysical Research: Planets*, 131(3), e2025JE009531.
- 2 Cheng, Z., Zhang, C., Dong, C., Zhou, H., **Gao, J.**, Tadlock, A., ... Wang, L. (2025). Revisiting mars' induced magnetic field and clock angle departures under real-time upstream solar wind conditions. *Journal of Geophysical Research: Space Physics*, 130(12), e2025JA034688.
- 3 **Gao, J.**, Dong, C., Zhang, C., Qin, Y., Shekarpaz, S., Li, X., ... Tadlock, A. (2025). Physics-informed neural networks for modeling the martian induced magnetosphere. *arXiv preprint arXiv:2512.16175*.
- 4 Shi, Z., Rong, Z., Fatemi, S., Dong, C., Klinger, L., Gao, J., ... Holmström, M. et al. (2025). Mercury's field-aligned currents: Perspectives from hybrid simulations. *Journal of Geophysical Research: Planets*, 130(2), e2024JE008610.
- 5 Tadlock, A., Dong, C., Zhang, C., Fränz, M., Zhou, H., & **Gao, J.** (2025). Magnetic field and plasma asymmetries between the martian quasi-perpendicular and quasi-parallel magnetosheaths. *Geophysical Research Letters*, 52(19), e2025GL118172.
- 6 Wen, Y., Rong, Z., Nilsson, H., Zhang, C., Shen, H.-W., & **Gao, J.** (2025). Statistical investigations of the radial interplanetary magnetic field component impact on the magnetotail current sheet structure of mars: Maven observations. *The Astrophysical Journal*, 993(2), 201.
- 7 Zhang, C., Dong, C., Zhou, H., Halekas, J., Li, X., **Gao, J.**, ... Ramstad, R. et al. (2025). Global energy transport and conversion in the solar wind-mars interaction: Maven observations. *Journal of Geophysical Research: Planets*, 130(10), e2025JE009295.
- 8 **Gao, J.**, Li, S., Mittelholz, A., Rong, Z., Persson, M., Shi, Z., ... Dong, C. et al. (2024). Two distinct current systems in the ionosphere of mars. *Nature Communications*, 15(1), 9704.
- 9 Gao, J., Rong, Z., Zhang, Q., Mittelholz, A., Zhang, C., & Wei, Y. (2024). Influence of upstream solar wind on magnetic field distribution in the martian nightside ionosphere. *Earth and Planetary Physics*, 8(5), 728–741.

- 10 He, F., Rong, Z., Wu, Z., **Gao, J.**, Fan, K., Zhou, X., ... Wei, Y. (2024). Martian dust storms: Reviews and perspective for the tianwen-3 mars sample return mission. *Remote Sensing*, 16(14), 2613.
- 11 Yue, Y., **Gao, J.**, He, F., Wei, Y., Cai, S., Wang, H., ... Lin, W. et al. (2024). Evolution and disappearance of the paleo-west pacific anomaly: Implications to the future of south atlantic anomaly. *Physics of the Earth and Planetary Interiors*, 107214.
- 12 Zhang, C., Rong, Z., Li, X., Fränz, M., Nilsson, H., Jarvinen, R., ... Yamauchi, M. et al. (2024). The energetic oxygen ion beams in the martian magnetotail current sheets: Hints from the comparisons between two types of current sheets. *Geophysical Research Letters*, 51(5), e2023GL107190.
- 13 Li, S., Lu, H., Cao, J., Cui, J., Ge, Y., Zhang, X., ... **Gao, J.** et al. (2023). Global electric fields at mars inferred from multifluid hall-mhd simulations. *The Astrophysical Journal*, 949(2), 88.
- 14 Li, X., Rong, Z., Fraenz, M., Zhang, C., Klinger, L., Shi, Z., ... Wei, Y. (2023). Two types of martian magnetotail current sheets: Maven observations of ion composition. *Geophysical Research Letters*, 50(2), e2022GL102630.
- 15 Panovska, S., Poluianov, S., **Gao, J.**, Korte, M., Mishev, A., Shprits, Y. Y., & Usoskin, I. (2023). Effects of global geomagnetic field variations over the past 100,000 years on cosmogenic radionuclide production rates in the earth's atmosphere. *Journal of Geophysical Research: Space Physics*, 128(8), e2022JA031158.
- 16 Teng, S., Sun, J., **Gao, J.**, Harada, Y., Fraenz, M., & Han, D. (2023). Maven observation of magnetosonic waves in the martian magnetotail region. *Earth and Planetary Physics*.
- 17 Zhang, C., Nilsson, H., Ebihara, Y., Yamauchi, M., Persson, M., Rong, Z., ... Zhou, X. et al. (2023). Detection of magnetospheric ion drift patterns at mars. *Nature communications*, 14(1), 6866.
- 18 Zhang, C., Rong, Z., Zhang, L., **Gao, J.**, Shi, Z., Klinger, L., ... Wei, Y. (2023). Properties of flapping current sheet of the martian magnetotail. *Journal of Geophysical Research: Space Physics*, 128(4), e2022JA031232.
- 19 **Gao, J.**, Korte, M., Panovska, S., Rong, Z., & Wei, Y. (2022). Geomagnetic field shielding over the last one hundred thousand years. *Journal of Space Weather and Space Climate*, 12, 31.
- 20 **Gao, J.**, Monika, K., Panovska, S., Rong, Z., & Wei, Y. (2022). Effects of the laschamps excursion on geomagnetic cutoff rigidities. *Geochemistry, Geophysics, Geosystems*, 23(2), e2021GCo10261.
- 21 Gong, F., Yu, Y., Cao, J., Wei, Y., **Gao, J.**, Li, H., ... Ridley, A. (2022). Simulating the solar wind-magnetosphere interaction during the matuyama-brunhes paleomagnetic reversal. *Geophysical Research Letters*, 49(3), e2021GL097340.
- 22 Zhang, C., Rong, Z., Klinger, L., Nilsson, H., Shi, Z., He, F., ... Ramstad, R. (2022). Three-dimensional configuration of induced magnetic fields around mars. *Journal of Geophysical Research: Planets*, 127(8), e2022JE007334.
- 23 **Gao, J.**, Rong, Z., Klinger, L., Li, X., Liu, D., & Wei, Y. (2021). A spherical harmonic martian crustal magnetic field model combining data sets of maven and mgs. *Earth and Space Science*, 8(10), e2021EA001860.
- 24 **Gao, J.**, Rong, Z., Persson, M., Stenberg, G., Zhang, Y., Klinger, L., ... Barabash, S. et al. (2021). In situ observations of the ion diffusion region in the venusian magnetotail. *Journal of Geophysical Research: Space Physics*, 126(1), e2020JA028547.
- 25 Liu, D., Rong, Z., **Gao, J.**, He, J., Klinger, L., Dunlop, M. W., ... Wei, Y. (2021). Statistical properties of solar wind upstream of mars: Maven observations. *The Astrophysical Journal*, 911(2), 113.
- 26 Li, X., Rong, Z., **Gao, J.**, Wei, Y., Shi, Z., Yu, T., & Wan, W. (2020). A local martian crustal field model: Targeting the candidate landing site of the 2020 chinese mars rover. *Earth and Planetary Physics*, 4(4), 420–428.

- 27 Zhang, C., Rong, Z., **Gao, J.**, Zhong, J., Chai, L., Wei, Y., ... Wan, W. (2020). The flapping motion of mercury's magnetotail current sheet: Messenger observations. *Geophysical Research Letters*, 47(4), e2019GL086011.
- 28 Zhang, C., Rong, Z., Shen, C., Klinger, L., **Gao, J.**, Slavin, J. A., ... Wei, Y. (2020). Examining the magnetic geometry of magnetic flux ropes from the view of single-point analysis. *The Astrophysical Journal*, 903(1), 53.
- 29 Yan, L., **Gao, J.**, Chai, L., Zhao, L., Rong, Z., & Wei, Y. (2019). Revisiting the strongest martian x-ray halo observed by xmm-newton on 2003 november 19–21. *The Astrophysical Journal Letters*, 883(2), L38.
- 30 **Gao, J.**, Rong, Z., Cai, Y., Lui, A., Petrukovich, A., Shen, C., ... Wan, W. (2018). The distribution of two flapping types of magnetotail current sheet: Implication for the flapping mechanism. *Journal of Geophysical Research: Space Physics*, 123(9), 7413–7423.
- 31 Rong, Z., Cai, Y., **Gao, J.**, Lui, A., Shen, C., Petrukovich, A., ... Wan, W. (2018). Cluster observations of a dispersive flapping event of magnetotail current sheet. *Journal of Geophysical Research: Space Physics*, 123(7), 5571–5579.

Miscellaneous Experience

Awards and Scholarships

- 2024  **Featured articles in Astronomy and planetary science.** Nature communications
- 2023  **Top viewed article 2023 in . Journal of Geophysical Research: space physics.** Wiley
-  **Top cited article 2022-2023 in GEOCHEMISTRY, GEOPHYSICS, GEOSYSTEMS.** Wiley
- 2022  **Outstanding Open Science Author of the Year.** Wiley China
- 2018  **National scholarship for doctoral students.**
- 2017  **Merit Student,** University of Chinese Academy of Science.
- 2016  **Geoscience student's scholarship,** China University of Geosciences (Wuhan).
- 2015  **National Second Prize, Contemporary Undergraduate Mathematical Contest in Modeling**

Selected Presentations

- 2025  **Gao, J., Dong, C., Wang, L., Qin, Y., (2025), Data-Driven Modeling of the Martian Induced Magnetosphere Using Physics-Informed Neural Networks (talk).** AGU Meeting.
- 2023  **Gao, J., Rong, Z., Wei, Y., et al., (2023), A new magnetosphere-ionosphere current system on Mars (talk).** EGU Meeting.
-  **Gao, J., Rong, Z., Wei, Y., et al., (2023), Current system on the Martian magnetosphere and ionosphere (talk).** AOGS Meeting.
- 2022  **Gao, J., Rong, Z., Wei, Y., et al., (2022), The looping magnetic field in the Martian ionosphere-implication for a new current system (talk).** AGU Meeting.
- 2021  **Gao, J., Rong, Z., Li, X., et al., (2021), A spherical harmonic martian crustal magnetic field model combining data sets of maven and mgs (poster).** AGU Meeting.

Miscellaneous Experience (continued)

- 2019  **Gao, J., Rong, Z., and Persson, M., et al., (2019), In situ observations of magnetic reconnection ion diffusion region in the Venusian magnetotail by Venus Express (talk).** Annual Meeting of Chinese Geoscience Union (CGU), Beijing, China.
- 2018  **Gao, J., Rong, Z., Wei, Y., et al., (2018), 3-D structure of the detached flux rope in Martian magnetosphere (poster).** Annual Meeting of Chinese Geoscience Union (CGU), Beijing, China.