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Education

2015	Ph.D. in Space Physics	UCLA
2010	B.A. in Space Physics	Peking University

Appointments

2019–present	Assistant Professor	University of Alabama in Huntsville
2017–2019	Postdoctoral Fellow	Univ Corp for Atmospheric Research (UCAR) & Boston University
2017	Research Scientist	Boston University
2015–2016	Postdoctoral Scholar	UCLA

Research Awards and Fellowships

2020	UAH New Faculty Research
2017	NASA Living With a Star Jack Eddy Postdoctoral Fellowship
2015	Jacob Bjercknes Award for academic excellence

Teaching Experience

2020	Honors Space Science	UAH
2020	Ionospheric and Magnetospheric Physics	UAH

Media Appearance

2017	“Studying the Auroras and What Makes Them Shine”, Scientia
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Research Grants

- “Ionospheric Feedback to Electron Scattering by Equatorial Whistler-Mode Waves”, **Zou, Y.** (PI), X. Zhang (Co-I), and A. Artemyev (Co-I), NASA Heliophysics Guest Investigator, **\$523,921**, 2021-2024
- “Specifying near-Earth solar wind conditions: a novel model for propagating solar wind values and uncertainties”, **Zou, Y.** (PI), H. Zhang (Co-I), and B. Walsh (Co-I), NASA Space Weather Science Applications Operations 2 Research, **\$476,660**, 2020-2022
- “Collaborative Research: Local Time Extent of Dayside Magnetopause Reconnection and Controlling Factors”, **Zou, Y.** (PI) and B. Walsh (Co-PI), NSF Magnetosphere, **\$442,595**, 2020-2023
- “Modelling the GIC Response from the Solar Wind to the Ground”, Ferdousi, B. (PI), **Y. Zou** (Co-I), J. Raeder (Co-I), NASA Living With a Star Science, **\$805,131**, 2020-2024
- “Magnetic Reconnection Rate and its Implications for Fast Reconnection Onset in Solar Flares and Magnetopause”, Qiang, H. (PI), **Y. Zou** (Co-I), H. Liang (Co-I), C. Liu (Co-I), Ju Jing (Co-I), NASA Living With a Star Science, **\$846,697**, 2020-2024
- “Characterizing mesoscale thermospheric F-region winds associated with quasi-steady and transient nightside auroral arcs”, **Zou, Y.** (PI) and Y. Nishimura (Co-PI), NSF Aeronomy, **\$414,751**, 2018-2021

- “Identifying properties of subauroral ion drifts”, Nishimura, Y. (PI) and **Y. Zou** (Co-I), NASA Heliophysics Guest Investigator Open Program **\$483,099**, 2018-2021
- “Understanding multi-scale convection on open magnetic field lines in the Sun-Earth system”, **Zou, Y.** (PI), NASA Living With a Star Jack Eddy Postdoctoral Fellowship, **\$127,870**, 2017-2019

Peer Reviewed Publications

1. **Zou, Y.**, Lyons, L., Conde, M., Varney, R., Angelopoulos, V., & Mende, S. (2020). Effects of substorms on high-latitude upper thermospheric winds. *Journal of Geophysical Research: Space Physics*, 125, e2020JA028193. <https://doi.org/10.1029/2020JA028193>
2. **Zou, Y.**, Walsh, B. M., Atz, E., Liang, H., Ma, Q., & Angelopoulos, V. (2020). A kinetic perspective on azimuthal variation of magnetopause reconnection at scales below an Earth radius. *Journal of Physics: Conference Series*, 1620, 012028. <https://doi.org/10.1088/1742-6596/1620/1/012028>
3. **Zou, Y.**, Walsh, B. M., Atz, E., Liang, H., Ma, Q., & Angelopoulos, V. (2020). Azimuthal Variation of Magnetopause Reconnection at Scales Below an Earth Radius. *Geophysical Research Letters*, 47(4), e2019GL086500.
4. **Zou, Y.**, Walsh, B. M., Nishimura, Y., Angelopoulos, V., Ruohoniemi, J. M., McWilliams, K. A., & Nishitani, N. (2019). Local time extent of magnetopause reconnection using space-ground coordination. *Annales Geophysicae*, 37(2), 215–234. <https://doi.org/10.5194/angeo-37-215-2019>
5. **Zou, Y.**, Walsh, B. M., Nishimura, Y., Angelopoulos, V., Ruohoniemi, J. M., McWilliams, K. A., & Nishitani, N. (2018). Spreading Speed of Magnetopause Reconnection X-Lines Using Ground-Satellite Coordination. *Geophysical Research Letters*, 45(1), 80–89. <https://doi.org/10.1002/2017GL075765>
6. **Zou, Y.**, Nishimura, Y., Lyons, L., Conde, M., Varney, R., Angelopoulos, V., & Mende, S. (2018). Mesoscale F Region Neutral Winds Associated With Quasi-steady and Transient Nightside Auroral Forms. *Journal of Geophysical Research: Space Physics*, 123(9), 7968–7984. <https://doi.org/10.1029/2018JA025457>
7. **Zou, Y.**, Nishimura, Y., Lyons, L. R., & Shiokawa, K. (2017). Localized polar cap precipitation in association with nonstorm time airglow patches. *Geophysical Research Letters*, 44(2), 609–617. <https://doi.org/10.1002/2016GL071168>
8. **Zou, Y.**, Nishimura, Y., Burchill, J. K., Knudsen, D. J., Lyons, L. R., Shiokawa, K., et al. (2016). Localized field-aligned currents in the polar cap associated with airglow patches. *Journal of Geophysical Research: Space Physics*, 121(10), 10,172-10,189. <https://doi.org/10.1002/2016JA022665>
9. **Zou, Y.**, Nishimura, Y., Lyons, L. R., Donovan, E. F., Shiokawa, K., Ruohoniemi, J. M., et al. (2015). Polar cap precursor of nightside auroral oval intensifications using polar cap arcs. *Journal of Geophysical Research: Space Physics*, 120(12), 10,698-10,711. <https://doi.org/10.1002/2015JA021816>
10. **Zou, Y.**, Nishimura, Y., Lyons, L. R., Shiokawa, K., Donovan, E. F., Ruohoniemi, J. M., et al. (2015). Localized polar cap flow enhancement tracing using airglow patches: Statistical

properties, IMF dependence, and contribution to polar cap convection. *Journal of Geophysical Research: Space Physics*, 120(5), 4064–4078.
<https://doi.org/10.1002/2014JA020946>

11. **Zou, Y.**, Nishimura, Y., Lyons, L. R., Donovan, E. F., Ruohoniemi, J. M., Nishitani, N., & McWilliams, K. A. (2014). Statistical relationships between enhanced polar cap flows and PBIs. *Journal of Geophysical Research: Space Physics*, 119(1), 151–162.
<https://doi.org/10.1002/2013JA019269>
12. **Zou, Y.**, Nishimura, Y., Lyons, L. R., & Donovan, E. F. (2012). A statistical study of the relative locations of electron and proton auroral boundaries inferred from meridian scanning photometer observations. *Journal of Geophysical Research: Space Physics*, 117(A6).
<https://doi.org/10.1029/2011JA017357>
13. Chen, Y., Toth, G., Hietala, H., Vines, S. K., **Zou, Y.**, Nishimura, Y., et al. (2020). Magnetohydrodynamic with embedded particle-in-cell simulation of the Geospace Environment Modeling dayside kinetic processes challenge event. *Earth and Space Science*, 7, e2020EA001331. <https://doi.org/10.1029/2020EA001331>
14. Liu, J., Lyons, L. R., Wang, C.-P., Hairston, M. R., Zhang, Y., & **Zou, Y.** (2020). Dawnside auroral polarization streams. *Journal of Geophysical Research: Space Physics*, 125, e2019JA027742. <https://doi.org/10.1029/2019JA027742>
15. Dimmock, A. P., Hietala, H., & **Zou, Y.** (2020). Compiling magnetosheath statistical data sets under specific solar wind conditions: Lessons learnt from the dayside kinetic southward IMF GEM challenge. *Earth and Space Science*. 7, e2020EA001095. <https://doi.org/10.1029/2020EA001095>
16. Nishimura, Y., Wang, B., **Zou, Y.**, Donovan, E. F., Angelopoulos, V., Moen, J. I., et al. (2020). Transient Solar Wind–Magnetosphere–Ionosphere Interaction Associated with Foreshock and Magnetosheath Transients and Localized Magnetopause Reconnection. In *Dayside Magnetosphere Interactions* (pp. 39–53). American Geophysical Union (AGU).
<https://doi.org/10.1002/9781119509592.ch3>
17. Li, T. C., Liu, Y.-H., Hesse, M., & **Zou, Y.** (2020). Three-Dimensional X-line Spreading in Asymmetric Magnetic Reconnection. *Journal of Geophysical Research: Space Physics*, 125(2), e2019JA027094. <https://doi.org/10.1029/2019JA027094>
18. Hosokawa, K., Kullen, A., Milan, S., Reidy, J., **Zou, Y.**, Frey, H. U., et al. (2020). Aurora in the Polar Cap: A Review. *Space Science Reviews*, 216(1), 15. <https://doi.org/10.1007/s11214-020-0637-3>
19. Hietala, H., Dimmock, A. P., **Zou, Y.**, & Garcia-Sage, K. (2020). The Challenges and Rewards of Running a Geospace Environment Modeling Challenge. *Journal of Geophysical Research: Space Physics*, 125(3), e2019JA027642. <https://doi.org/10.1029/2019JA027642>
20. Walsh, B. M., Bhakyapaibul, T., & **Zou, Y.** (2019). Quantifying the Uncertainty of Using Solar Wind Measurements for Geospace Inputs. *Journal of Geophysical Research: Space Physics*, 124(5), 3291–3302. <https://doi.org/10.1029/2019JA026507>
21. Nishimura, Y., Gallardo-Lacourt, B., **Zou, Y.**, Mishin, E., Knudsen, D. J., Donovan, E. F., et al. (2019). Magnetospheric Signatures of STEVE: Implications for the Magnetospheric Energy Source and Interhemispheric Conjugacy. *Geophysical Research Letters*, 46(11), 5637–5644. <https://doi.org/10.1029/2019GL082460>

22. Hosokawa, K., **Zou, Y.**, & Nishimura, Y. (2019). Airglow Patches in the Polar Cap Region: A Review. *Space Science Reviews*, 215(8), 53. <https://doi.org/10.1007/s11214-019-0616-8>
23. Goodwin, L. V., Nishimura, Y., **Zou, Y.**, Shiokawa, K., & Jayachandran, P. T. (2019). Mesoscale Convection Structures Associated With Airglow Patches Characterized Using Cluster-Imager Conjunctions. *Journal of Geophysical Research: Space Physics*, 124(9), 7513–7532. <https://doi.org/10.1029/2019JA026611>
24. Frey, H. U., Han, D., Kataoka, R., Lessard, M. R., Milan, S. E., Nishimura, Y., et al. (2019). Dayside Aurora. *Space Science Reviews*, 215(8), 51. <https://doi.org/10.1007/s11214-019-0617-7>
25. Wang, B., Nishimura, Y., Hietala, H., Shen, X.-C., Shi, Q., Zhang, H., et al. (2018). Dayside Magnetospheric and Ionospheric Responses to a Foreshock Transient on 25 June 2008: 2. 2-D Evolution Based on Dayside Auroral Imaging. *Journal of Geophysical Research: Space Physics*, 123(8), 6347–6359. <https://doi.org/10.1029/2017JA024846>
26. Walsh, B. M., Welling, D. T., **Zou, Y.**, & Nishimura, Y. (2018). A Maximum Spreading Speed for Magnetopause Reconnection. *Geophysical Research Letters*, 45(11), 5268–5273. <https://doi.org/10.1029/2018GL078230>
27. Lyons, L. R., **Zou, Y.**, Nishimura, Y., Gallardo-Lacourt, B., Angelopoulos, V., & Donovan, E. F. (2018). Stormtime substorm onsets: occurrence and flow channel triggering. *Earth, Planets and Space*, 70(1), 81. <https://doi.org/10.1186/s40623-018-0857-x>
28. Lyons, L. R., Gallardo-Lacourt, B., **Zou, Y.**, Nishimura, Y., Anderson, P., Angelopoulos, V., et al. (2018). Driving of strong nightside reconnection and geomagnetic activity by polar cap flows: Application to CME shocks and possibly other situations. *Journal of Atmospheric and Solar-Terrestrial Physics*, 177, 73–83. <https://doi.org/10.1016/j.jastp.2017.09.013>
29. Liu, J., Lyons, L. R., Archer, W. E., Gallardo-Lacourt, B., Nishimura, Y., **Zou, Y.**, et al. (2018). Flow Shears at the Poleward Boundary of Omega Bands Observed During Conjunctions of Swarm and THEMIS ASI. *Geophysical Research Letters*, 45(3), 1218–1227. <https://doi.org/10.1002/2017GL076485>
30. Wang, B., Nishimura, Y., **Zou, Y.**, Lyons, L. R., Angelopoulos, V., Frey, H., & Mende, S. (2016). Investigation of triggering of poleward moving auroral forms using satellite-imager coordinated observations. *Journal of Geophysical Research: Space Physics*, 121(11), 10,929–10,941. <https://doi.org/10.1002/2016JA023128>
31. Wang, B., Nishimura, Y., Lyons, L. R., **Zou, Y.**, Carlson, H. C., Frey, H. U., & Mende, S. B. (2016). Analysis of close conjunctions between dayside polar cap airglow patches and flow channels by all-sky imager and DMSP. *Earth, Planets and Space*, 68(1), 150. <https://doi.org/10.1186/s40623-016-0524-z>
32. Lyons, L. R., Nishimura, Y., & **Zou, Y.** (2016). Unsolved problems: Mesoscale polar cap flow channels' structure, propagation, and effects on space weather disturbances. *Journal of Geophysical Research: Space Physics*, 121(4), 3347–3352. <https://doi.org/10.1002/2016JA022437>
33. Nishimura, Y., Lyons, L. R., **Zou, Y.**, Oksavik, K., Moen, J. I., Clausen, L. B., et al. (2014). Day-night coupling by a localized flow channel visualized by polar cap patch propagation. *Geophysical Research Letters*, 41(11), 3701–3709. <https://doi.org/10.1002/2014GL060301>

34. Lyons, L. R., Nishimura, Y., Gallardo-Lacourt, B., **Zou, Y.**, Donovan, E., Mende, S., et al. (2013). Westward traveling surges: Sliding along boundary arcs and distinction from onset arc brightening. *Journal of Geophysical Research: Space Physics*, 118(12), 7643–7653. <https://doi.org/10.1002/2013JA019334>

Invited Presentations

- 2020 Plasma transport at the cusp and the polar cap, Center for Geospace Storms first workshop (remote presentation), Applied Physics Laboratory Johns Hopkins University
- 2020 The Earth's Magnetopause, Magnetosphere Online Seminar Series (remote presentation), NASA Goddard Space Flight Center
- 2020 Azimuthal Structure of Magnetic Reconnection at the Earth's Magnetopause, 19th Annual International Astrophysics Conference, Santa Fe, New Mexico
- 2019 Substorm-driven winds and their possible preconditioning role for STEVE, MiniGEM workshop, San Francisco, California
- 2018 Localized transients in the polar cap and their connection to day- and nightside auroras. International Space Science Institute on Auroral Physics, Bern, Switzerland
- 2018 Spreading speed of magnetopause reconnection X-lines, 5th Cluster-THEMIS workshop, Chania, Crete, Greece
- 2018 Local time extent of magnetopause reconnection X-lines: from patchy to extended. Dartmouth College, Hanover, New Hampshire
- 2018 Local time extent of magnetopause reconnection X-lines: from patchy to extended. Dayside Science Teleconference (remote presentation), NASA Goddard Space Flight Center
- 2017 Spreading speed of magnetopause reconnection X-lines using space-ground coordination. West Virginia University, Morgantown, West Virginia
- 2014 Localized polar cap flow enhancement and evolution using airglow patches. University of Calgary, Calgary, Alberta, Canada