**CURRICULUM VITAE**

**Name:** **Yangyang Shen**
**Contacts:** Department of Earth, Planetary and Space Sciences at
University of California, Los Angeles
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**Education & Degrees:**

2011/2013 B.E. in Communication Engineering/M.S. in Space Physics
School of Electronic Information, Wuhan University (China)
2019 Ph.D. in Space Physics, Physics and Astronomy
University of Calgary (Canada)
Ph.D. Thesis: "*Microphysics of ion and electron energization in the topside ionosphere*"
Thesis advisor: Prof. David J Knudsen

**Appointments**

Jan 2020 – present: Assistant Researcher, EPSS, University of California Los Angeles

**Research Activities:**

- Wave-particle interactions in the Earth's magnetosphere and ionosphere: Electron scattering and precipitation from the Earth's magnetosphere driven by kinetic Alfvén waves, whistler-mode waves, time domain structures, and VLF transmitter waves.
- Numerical simulations of space plasmas: Test particle simulations and Liouville mapping on electron and ion distribution function evolution
- Ion upflow, outflow, and plasma heating in the ionosphere: Observations from various in-situ and ground-based plasmas and fields
- Analysis and calibration of low-energy ion and electron measurements from the e-POP spacecraft

**NASA PI/Co-I Awards:**

- ***NASA HGI***: Plasma sheet electron precipitation driven by broadband electrostatic fluctuations in the magnetotail, 2023-2026, ***PI***.
- ***NASA HGI***: Energetic electron scattering by kinetic Alfven waves in Earth's radiation belt, 2022-2025, ***Institutional-PI/Co-I***.

**Other Awards & Professional Service**:

- 1st Prize in CEDAR student poster competition (IT session), Keystone, CO, US, 2017
- Eyes High Doctoral Recruitment Scholarship, University of Calgary, 2014-2018
- Referee for *JGR-Space Physics*, *Geophysical Research Letters*, *Science Advances*
- Judge for student paper competition in AGU and GEM conferences
- THEMIS Tohban since 2023
- NSF Panelist

**Publications**

1) ***Shen, Y.***, Artemyev, A. V., Runov, A., Angelopoulos, V., Liu, J., Zhang, X.-J., et al. (2023). Energetic electron flux dropouts measured by ELFIN in the ionospheric projection of the plasma sheet. J. Geophys. Res. Space Physics, 128, e2023JA031631. https://doi.org/10.1029/2023JA031631.
2) ***Shen, Y.***, Artemyev, A. V., Zhang, X.-J., Zou, Y., Angelopoulos, V., Vasko, I., et al. (2023). Contribution of kinetic Alfvén waves to energetic electron precipitation from the plasma sheet during a substorm. *J. Geophys. Res. Space Physics*, 128, e2023JA031350. https://doi.org/10.1029/2023JA031350
3) ***Shen, Y.***, Artemyev, A. V., Ma, Q., Zhang, X.-J., Mourenas, D., Tsai, E., et al. (2022). Inner belt wisp precipitation measured by ELFIN: Regimes of energetic electron scattering by VLF transmitter waves. *J. Geophys. Res. Space Physics*, 127, e2022JA030968. https://doi.org/10.1029/2022JA030968
4) ***Shen, Y.***, Artemyev, A., Vasko, I., Zhang, X.-J., Angelopoulos, V., An, X., Runov, A. (2022). Energetic electron scattering by kinetic Alfvén waves at strong magnetic field gradients of dipolarization front. *Physics of Plasmas*, 29, 082901. https://doi.org/10.1063/5.0096338.
5) ***Shen, Y.***, A. V. Artemyev, X.-J. Zhang, V. Angelopoulos, I. Y. Vasko, D. L. Turner, et al. (2022), Tens to hundreds of keV electron precipitation driven by kinetic Alfvén waves during an electron injection, *J. Geophys. Res. Space Physics,* 127, e2022JA030360. https://doi.org/10.1029/2022JA030360.
6) ***Shen, Y.***, Chen, L., Zhang, X.-J., Artemyev, A., Angelopoulos, V., Cully, C. M, et al. (2021). Conjugate observation of magnetospheric chorus propagating to the ionosphere by ducting. *Geophysical Research Letters*, 48, e2021GL095933. https://doi.org/10.1029/2021GL095933.
7) ***Shen, Y.,*** Vasko, I.Y., Artemyev, A., Malaspina, D.M., Chu, X., Angelopoulos, V., & Zhang, X.J. (2021). Realistic electron diffusion rates and lifetimes due to scattering by electron holes. J. Geophys. Res. Space Physics, 126, e2021JA029380. https://doi.org/10.1029/2021JA029380.
8) ***Shen, Y.,*** Artemyev, A., Zhang, X.-J., Vasko, I.Y., Runov, A., Angelopoulos, V., & Knudsen, D. (2020). Potential evidence of low-energy electron scattering and ionospheric precipitation by time domain structures. Geophysical Research Letters, 47, e2020GL089138, doi:10.1029/2020GL089138.
9) ***Shen, Y.,*** & Knudsen, D. J. (2020). On O+ ion heating by BBELF waves at low altitude: Test particle simulations. J. Geophys. Res. Space Physics, 125, doi:10.1029/2019JA027291.
10) **Shen, Y.,** & Knudsen, D. J. (2020). Suprathermal electron acceleration perpendicular to the magnetic field in the topside ionosphere. J. Geophys. Res. Space Physics, 125, e2019JA027449, doi:10.1029/2019JA027449.
11) ***Shen, Y.,*** D. J. Knudsen, J. K. Burchill, A. Howarth, A.Yau, D. M. Miles, H. G. James, G. W. Perry, L. Cogger (2018). Low-altitude ion heating, downflowing ions, and BBELF

waves in the return current region, *J. Geophys. Res. Space Physics*, 123, 3087-3110, doi:10.1029/2017JA024955. ***(EOS Research Spotlight)***

12) ***Shen, Y.***, D. J. Knudsen, J.K. Burchill, et al. (2016). Strong ambipolar-driven ion upflow within the cleft ion fountain during low geomagnetic activity, *J. Geophys. Res. Space Physics*, 121(7), 6950-6969, doi:10.1002/2016JA022532.
13) Angelopoulos, V., X.-J. Zhang, A. V. Artemyev, D. Mourenas, E. Tsai, C. Wilkins, A. Runov, J. Liu, D. L. Turner, W. Li, K. Khurana, R. E. Wirz, V. A. Sergeev, X. Meng, J. Wu, M. D. Hartinger, T. Raita, ***Y. Shen***, X. An, et al. (2023). Energetic electron precipitation driven by electromagnetic ion cyclotron waves: First results from ELFIN. *Space Science Reviews*, accepted.
14) Khazanov, G.V., ***Shen, Y.***, Vasko, I.Y. Artemyev, A.V., & Chu,M. (2021). Magnetosphere-ionosphere coupling of precipitated electrons in diffuse aurora driven by time domain structures, *Geophys. Res. Lett.*, 48, e2021GL092655, doi:10.1029/2021GL092655.
15) Wu, J., Knudsen, D.J., ***Shen, Y.***, & Gillies, D.M. (2021). E-POP observations of suprathermal electron bursts in the ionospheric Alfvén resonator, *J. Geophys. Res.*, 126, e2020JA028005, doi:10.1029/2020JA028005.
16) Artemyev, A.V., Zhang, X.-J, Angelopoulos, V., Mourenas, V., Vainchtein, D., ***Shen, Y.***, Vasko, I.Y., & Runov, A. (2020). Ionospheric feedback to electron scattering by equatorial whistler mode waves, *J. Geophys. Res.*, 125, e2020JA028373, doi:10.1029/2020JA028373.
17) Liang, J., ***Shen, Y.***, Knudsen, D.J., Spanswick, E., Burchill, J., & Donovan, E. (2019). e-POP and red line optical observations of Alfvénic auroras, *J. Geophys. Res. Space Physics*, 124, 4672-4696, doi:10.1029/2019JA026679. ***(JGR Editor's Highlight)***
18) Wu, J., Bryant, M.S., Ridley, C.G., ***Shen, Y.***, Yang, L., Clausen, L.B.N, McWilliams, K.A., Murphy, K.R., Mann, I. R., Ozeke, L.G., Korth, H., Anderson, B.J., &Waters, C.L. (2017). A comparison of small-scale magnetic fluctuations in the region 1 and region 2 field-aligned current systems, *J. Geophys. Res. Space Physics*, 122, 3277-3290, doi:10.1002/2016JA023453.

**Selected Conference Presentations**

1) Inner belt wisp precipitation measured by ELFIN: regimes of energetic electron scattering by VLF transmitter waves, 2023 GEM *Poster Presentation*, June 12-16, 2023.
2) Contribution of Kinetic Alfven Waves to Energetic Electron Precipitation from the Nightside Transition Region during a Substorm, 2023 GEM *Oral Presentation*, June 12-16, 2023.
3) Inner belt wisp precipitation measured by ELFIN: regimes of energetic electron scattering by VLF transmitter waves, 2022 American Geophysical Union Annual Meeting *Oral Presentation*, Virtual, December 12-16, 2022.
4) Contribution of kinetic Alfvén waves to energetic electron scattering and precipitation from plasma sheet injections, GEM workshop 2022 *Oral Presentation*, Virtual, June 19-24, 2022.
5) Tens to hundreds of keV electron precipitation driven by kinetic Alfvén waves associated with magnetotail injections, 2021 American Geophysical Union Annual Meeting *Oral Presentation*, Virtual, December 13-17, 2021.

6) Micro-scale plasma heating in the topside ionosphere: Results from e-POP/Swarm-E, CAP-Division of Atmospheric and Space Physics (DASP), ***Invited Oral Presentation***, Calgary, Canada, February 17, 2021.
7) Potential evidence of low-energy electron scattering and ionospheric precipitation by time domain structures, 2020 American Geophysical Union Annual Meeting *Oral Presentation*, Virtual, December 7-11, 2020.
8) Plasma heating perpendicular to the magnetic field in the topside ionosphere, 2019 American Geophysical Union Annual Meeting *Poster Presentation*, San Francisco, CA, December 9-13, 2019.
9) Small-scale O+ ion energization and magnetic field-aligned ion bulk flow in the topside ionosphere, Living Planet Symposium 2019 *Poster Presentation*, Milan, Italy, May 13-17, 2019.
10) Plasma energization and field-aligned bulk flow observations from the Suprathermal Electron/Ion Imager (SEI) instrument, 2018 American Geophysical Union Annual Meeting ***Invited Oral Presentation***, Washington DC, US, December 10-14, 2018.
11) Ion dynamics in single and multiple electrostatic waves: Simulation and data comparison, 2018 American Geophysical Union Annual Meeting *Poster Presentation*, Washington DC, US, December 10-14, 2018.
12) Low-altitude ion heating with downflowing and upflowing ions, 2018 National Radio Science Meeting *Oral Presentation*, Boulder, Colorado, January 4-7, 2018.
13) Low-altitude ion heating, downflowing ions, and broadband waves in the return current region, American Geophysical Union Annual Meeting *Oral Presentation*, New Orleans, December 11-17, 2017.
14) Low-altitude ion heating and downflowing and upflowing ions. 2017 CEDAR Workshop *Poster Presentation*, Keystone, CO, June 18-25, 2017.
15) Strong ambipolar-driven ion upflow within the cleft ion fountain during low geomagnetic activity. 2017 Swarm Science Meeting *Poster Presentation*, Banff, AB, March 20-24, 2017.
16) Anisotropic ion heating and broadband waves within the low-altitude ion upflow region, American Geophysical Union Annual Meeting *Oral Presentation*, San Francisco, December 12-16, 2016.
17) Investigation of ion heating signatures. CEDAR *Poster Presentation*, Santa Fe, New Mexico, US, June 19-24, 2016.
18) Cusp ion fountain observations from the e-POP Suprathermal Electron Imager (SEI), American Geophysical Union Annual Meeting *Poster Presentation*, San Francisco, December 14-18, 2015.