Aidi Zhang

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Work

2024 – Now **Postdoctoral Scholar**, University of Chicago
Studying geophysical fluid dynamics in climate problems.

Education

2017 – 2024 **Ph.D, Mechanical Engineering, University of California, Berkeley, USA**
Thesis title: *The Fluid Dynamics of Three-dimensional Jovian Vortices including the Great Red Spot*

2013 – 2017 **B.Eng., Theoretical and Applied Mechanics, Sun Yat-Sen University, China**
Thesis title: *The study of two-dimensional Rayleigh-Bénard Convection with different Prandtl number*

Research Publications

Journal Articles

1. A. Zhang and P. Marcus, "Stable three-dimensional vortex families consistent with jovian observations including the great red spot," *Journal of Fluid Mechanics*, vol. 984, A61, 2024.
2. A. Zhang, P. Marcus, and K. Sungkyu, "A three-dimensional spectral anelastic code for non-uniform shearing, stratified flow," in preparation for Journal of Computational Physics.
3. A. Zhang, P. S. Marcus, A. I. Ermakov, *et al.*, "A three-dimensional stable vortex consistent with multiple proxies of jupiter's great red spot," in preparation for Science.

Conference Proceedings

1. P. Marcus and A. Zhang, "Vertical aspect ratios and longevities of complex vortices and the application to gfd flows and astrophysical vortices," in *APS Division of Fluid Dynamics Meeting Abstracts*, 2021, H24–009.
2. P. S. Marcus, P. Hassanzadeh, M. H. Wong, *et al.*, "On the shedding of jupiter's red flakes," in *AGU fall meeting abstracts*, vol. 2019, 2019, P13B–3505.
3. A. Zhang, A. Ermakov, and P. S. Marcus, "Gravity signatures of stable, equilibrial 3d great red spot solutions consistent with observed cloud-level velocities," in *AGU Fall Meeting Abstracts*, vol. 2022, 2022, P32C–1848.
4. A. Zhang and P. Marcus, "How the great red spot of jupiter stays alive while losing energy through viscous and radiative dissipation," in *APS Division of Fluid Dynamics Meeting Abstracts*, 2019, B13–004.
5. A. Zhang and P. Marcus, "Hydrodynamic stability constraints on the three-dimensional structure of planetary vortices," APS, 2022.

6. A. Zhang and P. Marcus, "Longevity of stratified anticyclones with thermal dissipation and cyclones with viscous dissipation and their relevance to jupiter," in *APS Division of Fluid Dynamics Meeting Abstracts*, 2021, T11–011.

7. A. Zhang and P. Marcus, "Numerical study of stable planetary three-dimensional vortices with a hollow vorticity core," in *APS Division of Fluid Dynamics Meeting Abstracts*, 2023, pp. X13–007.

8. A. Zhang and P. Marcus, "Stable 3-dimensional vortex families consistent with jovian observations including the great red spot," in *AAS Division of Planetary Sciences Meeting joint with EPSC Abstracts*, 2023.

9. A. Zhang, P. S. Marcus, I. De Pater, A. Ermakov, and C. Moeckel, "Three-dimensional vortex families consistent with jovian observations including the great red spot," in *AGU Fall Meeting Abstracts*, vol. 2023, 2023, P23C–3073.

Miscellaneous Experience

Research Experiences

2024 - Now — Research on the fluid dynamics of atmosphere rivers, University of Chicago

2018 - 2024 — Research about the longevity and three-dimensional structure of the Great Red Spot on Jupiter, University of California, Berkeley

2016 - 2017 — the Study of two-dimensional Rayleigh-Bénard Convection with different Pr number, Sun Yat-Sen University

2015 - 2016 — applying Big Bang-Big Crunch algorithm in structure health analysis, Sun Yat-Sen University

Awards

2023 — **Chang-Lin Tien Graduate Fellowship**, University of California, Berkeley

2022 — **Robert P. Lin Graduate Fellowship**, Space Science Lab, University of California, Berkeley

2020 — **Graduate Division Summer Grant**, University of California, Berkeley

2019 — **Graduate Division Summer Grant**, University of California, Berkeley

2018 — **Graduate Division Summer Grant**, University of California, Berkeley

2015 — **Outstanding undergraduate student**, Sun Yat-Sen University

2014 — **Outstanding undergraduate student**, Sun Yat-Sen University

Internships

2022 — **Robert P. Lin Fellow**, the Space Science Laboratory at University of California, Berkeley

2016 — Internship in South China Sea Institute of Oceanology, Chinese Academy of Science