

Adhithiya Sivakumar

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in LinkedIn

Research Interests

- Fluid Dynamics 📌 Geophysical/Astrophysical Flows, Magnetohydrodynamics, Biological Flows, Complex Fluids.
- Applied Mathematics 📌 Dynamical Systems Theory, Asymptotics, Data-driven Reduced Modeling, High Performance Computing.

Education

- 2025 📌 **Ph.D., Mechanical Engineering, University of New Hampshire.**
Thesis: *The long and short of it: Exploring the essential dynamics of select geophysical flows.*
Advisor: Prof. Gregory P. Chini
- 2019 📌 **M.S. Applied Mathematics, University of Colorado Boulder.**
Thesis: *Dynamics of a three-dimensional heton.*
Advisor: Prof. Jeffrey B. Weiss
- 2017 📌 **B.E. Mechanical Engineering, Anna University.**
Thesis: *Vortex shedding in a duct with an orifice.*
Advisor: Dr. Somasundaram S.

Professional Development

- 2024 📌 **Fellow**, Summer Program in GFD, Woods Hole Oceanographic Institution.
Project: *The Dynamics of Stacked Stratified Shear Layers*
Advisor(s): Prof. C.P. Caulfield, Prof. A. Kaminski.
- 2022 📌 **Participant**, Summer School in Condensed Matter Physics, University of Colorado Boulder.
Poster: *Generalized Quasilinear Simulations of 2D, Strongly Stratified Kolmogorov Flow.*



Scholarships, Honors, and Awards

- 2024 📌 **Dissertation Year Fellowship**, University of New Hampshire.
- 2024 📌 **Geophysical Fluid Dynamics (GFD) Fellowship**, Woods Hole Oceanographic Institution.
- 2023 📌 **Summer Teaching Assistant Fellowship**, University of New Hampshire.
- 2022 📌 **Summer Teaching Assistant Fellowship**, University of New Hampshire.

Technical Skills

- Coding 📌 Python, MATLAB, Julia, Fortran, C++, OpenMP, MPI, Shell scripting.
- Software 📌 Dedalus, Mathematica, Git.

Teaching


- 2019 – 2024  **Teaching Assistant, University of New Hampshire.**
Courses: *Introduction to Engineering Computing, Thermodynamics, Fluid Dynamics.*
- 2017 – 2019  **Teaching Assistant, University of Colorado Boulder.**
Courses: *Differential Equations and Linear Algebra.*

Research Products and Communications

Manuscripts in Preparation

- 1 **A. Sivakumar**, K. Julien, and G. P. Chini, *On the Accuracy and Efficiency of the Reduced Craik-Leibovich Equations.*

Journal Articles

- 1 **A. Sivakumar** and J. B. Weiss, “Volume Transport by a 3D Quasigeostrophic Heton,” *Fluids*, vol. 7, no. 3, p. 92, Mar. 2022, ISSN: 2311-5521.  DOI: 10.3390/fluids7030092.

Technical Reports

- 1 **A. Sivakumar**, “The Dynamics of Stacked Stratified Shear Layers,” Woods Hole Oceanographic Institution, To appear in the Proceedings of the 2024 Program in Geophysical Fluid Dynamics.

Conference Presentations

- 1 **A. Sivakumar**, A. K. Kaminski, and C.-C. P. Caulfield, “The Dynamics of Stacked Density-Stratified Shear Layers,” in *Bulletin of the American Physical Society*, vol. 69, American Physical Society, 2024.
- 2 **A. Sivakumar**, K. Julien, and G. P. Chini, “Numerical simulations of ‘pure’ Langmuir turbulence,” in *Bulletin of the American Physical Society*, vol. 68, American Physical Society, 2023.
- 3 **A. Sivakumar**, K. Julien, and G. Chini, “Evaluation of the reduced Craik-Leibovich equations,” in *Bulletin of the American Physical Society*, vol. 67, American Physical Society, 2022.
- 4 **A. Sivakumar** and G. Chini, “Generalized Quasilinear Simulations of Strongly Stratified Kolmogorov Flow,” in *Bulletin of the American Physical Society*, vol. 65, American Physical Society, 2020.

Invited Talks

- 1 J. B. Weiss and **A. Sivakumar**, “Hamiltonian Dynamics in Three Dimensional Geophysical Vortices,” SIAM Conference on Applications of Dynamical Systems, 2025.