





Ben Wilfong


1 Basic Information


Title: Graduate Research Assistant

 Georgia Institute of Technology
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Research Interests: Computational fluid dynamics, hydrodynamic instability, multiphase fluid dynamics, high performance computing, GPU accelerated modeling and simulation

2 Education

 Georgia Institute of Technology
(In Progress) Doctor of Philosophy, Computational Science and Engineering
Advisor: Dr. Spencer Bryngelson
Relevant coursework: High Performance Computing (S24), Turbulent Fluid Flows (S24), Iterative Methods for Systems of Equations (F23), Numerical Linear Algebra (S23), Viscous Fluid Flows (F22)

 Rose-Hulman Institute of Technology
(2022) Bachelor of Science, Mechanical Engineering and Computational Science

3 Experience





 Weapons and Complex Integration Intern June 2022 – August 2022

Institution: Lawrence Livermore National Laboratory
Supervisor: Dr. Kyle Sinding
Duties: Perform finite element simulation using LLNL's HPC resources using ALE3D, generate case files and input data, post-process data to gather useful quantities of interest like shock wave arrival time and pressure profiles

 EERE High Performance Computing for Manufacturing Intern June 2021 – August 2021

Institution: Lawrence Livermore National Laboratory in collaboration with Oak Ridge Institute for Science and Education (ORISE)
Supervisor: Dr. John Karnes
Duties: Perform molecular dynamics simulations using LLNL's HPC resources using LAMMPS, generate case files and input data, post-process data to gather useful quantities of interest like reaction rates and percent conversion

4 Awards

-  (2025) ACM Gordon Bell Prize Finalist (*Simulating many-engine spacecraft: Exceeding 1 quadrillion degrees of freedom via information geometric regularization*)
-  (2024) CRNCH Fellowship for Novel Computing Paradigms and Hierarchies
-  (2022) Georgia Tech Presidents Fellowship
-  (2018-22) Deans List, Rose-Hulman Institute of Technology

5 Professional activity

5.1 Memberships

- › (2024-Present) Association for Computing Machinery (ACM), Member
- › (2024-Present) American Physical Society (APS), Member

6 Service and Outreach

- › (2025) SC25 student volunteer
- › (2023-Present) Presidents undergraduate research award reviewer
- › (2023-24) CSE Graduate Student Association vice-president
- › (2022-23) CSE Graduate Student Association events officer

7 Media

The following media mentions work that I have made significant contributions to, either through direct authorship or as a member of the research team.

- 📺 (2025) Shock Treatment for CFD Simulation [[LINK](#)]
- 📺 (2025) The OLCF's Problem Busters [[LINK](#)]
- 📺 (2023) Group Optimizes Fluid Dynamics Simulator on World's Fastest Supercomputer [[LINK](#)]

8 Publications

8.1 Preprints

- [PP3] B. Wilfong, A. Radhakrishnan, H. Le Berre, D. J. Vickers, T. Prathi, N. Tselepidis, B. Dorschner, R. Budiardja, B. Cornille, S. Abbott, F. *Schäfer, and S. H. *Bryngelson (2025). “Simulating many-engine spacecraft: Exceeding 1 quadrillion degrees of freedom via information geometric regularization”. *arXiv:2505.07392*, *Equal contribution. DOI: [10.48550/arXiv.2505.07392](#)
- [PP2] B. *Wilfong, H. *Le Berre, A. *Radhakrishnan, A. Gupta, D. Vaca-Revelo, D. Adam, H. Yu, H. Lee, J. R. Chreim, M. Carcana Barbosa, Y. Zhang, E. Cisneros-Garibay, A. Gnanaskandan, M. Rodriguez Jr., R. D. Budiardja, S. Abbott, T. Colonius, and S. H. Bryngelson (2025). “MFC 5.0: An exascale many-physics flow solver”. *Equal contribution. DOI: [10.48550/arXiv.2503.07953](#)
- [PP1] T. Chu, B. Wilfong, T. Koehler, R. M. McMullen, and S. H. Bryngelson (2025). “Competing mechanisms at vibrated interfaces of density-stratified fluids”. DOI: [10.48550/arXiv.2505.23578](#)

8.2 Archival, heavily referred papers

- [P1] A. Radhakrishnan, H. Le Berre, B. Wilfong, J.-S. Spratt, M. Rodriguez Jr., T. Colonius, and S. H. Bryngelson (2024). “Method for portable, scalable, and performant GPU-accelerated simulation of multiphase compressible flow”. In: *Computer Physics Communications* 302, p. 109238. DOI: [10.1016/j.cpc.2024.109238](#)

8.3 Conference papers

- [C2] B. A. Wilfong, R. McMullen, T. Koehler, and S. H. Bryngelson (2024). “Instability of Two-Species Interfaces via Vibration”. In: *AIAA AVIATION FORUM AND ASCEND 2024*. DOI: 10.2514/6.2024-4480
- [C1] B. Wilfong, A. Radhakrishnan, H. A. Le Berre, S. Abbott, R. D. Budiardja, and S. H. Bryngelson (2024). “OpenACC offloading of the MFC compressible multiphase flow solver on AMD and NVIDIA GPUs”. In: *Proceedings of the SC '24 Workshops of The International Conference on High Performance Computing, Network, Storage, and Analysis*. DOI: 10.48550/arXiv.2409.10729

8.4 Abstracts

- [A2] B. Wilfong, T. Chu, R. McMullen, T. Koehler, and S. H. Bryngelson (2024). “Hydrodynamic instability and breakup of a liquid-gas interface via vibration”. In: *74th Annual Meeting of the APS Division of Fluid Dynamics (APS DFD)*. Salt Lake City, UT
- [A1] B. Wilfong, A. Radhakrishnan, and S. H. Bryngelson (2024). “Multiphase flow numerics: Perspectives from exascale simulation”. In: *5th International Conference on Numerical Methods for Multiphase Flow (ICNMMF)*. Reykjavik, Iceland

9 Skills

- *Programming Languages/Paradigms*: Fortran, OpenACC, MPI, Matlab, Bash
- *Software and Tools*: Paraview, VisIt, Solidworks, SLURM, PBS, Nsys Systems, Nsight Compute, RocProf, Omniperf, fypp