



# Ben Wilfong

## 1 Basic Information

**Title:** Graduate Research Assistant

 Georgia Institute of Technology


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 [benwilfong.com](http://benwilfong.com)

 [github.com/wilfonba](https://github.com/wilfonba)

**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

 (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

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

## 7 Publications

### 7.1 Preprints

- [PP1] 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”. DOI: [10.48550/arXiv.2503.07953](https://doi.org/10.48550/arXiv.2503.07953)

### 7.2 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](https://doi.org/10.1016/j.cpc.2024.109238)

### 7.3 Conference papers

- [C2] B. A. Wilfong, R. McMullen, T. Koehler, and S. H. Bryngelson (n.d.). “Instability of Two-Species Interfaces via Vibration”. In: *AIAA AVIATION FORUM AND ASCEND 2024*. DOI: [10.2514/6.2024-4480](https://doi.org/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](https://doi.org/10.48550/arXiv.2409.10729)

### 7.4 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

## 8 Skills

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