@henryleberre | **Henry A. Le Berre [U.S. & French Citizen]** | henryleberre@gmail.com

WORK EXPERIENCE

SpaceX – Space Exploration Technologies Corp.

- **Software Propulsion Engineer I** — **January 2025 – Present**
  Raptor Combustion Devices Engineering | Raptor Production Group — Los Angeles, CA, USA [Onsite]
- **Software Engineering Intern** — **August – December 2023**
  Raptor Combustion Devices Engineering | Raptor Production Group — Los Angeles, CA, USA [Onsite]

25% speed up of the **Raptor Combustion CFD Code** on production simulations through C++ CUDA GPU kernel optimizations

Verkada Inc.

- **Software Engineering Intern** — **May – August 2023**
  Device Platform Team | Alarms and Intrusion — San Mateo, CA, USA [Onsite]

Verkadathon (Verkada Hackathon) **Winner** for "Best Use of Verkada Products" with Viraj Ramakrishnan and Jay Chou

Computational Physics Group @ Georgia Tech.

- **Student Assistant** — **Summer 2022/2024**
  School of Computational Science and Engineering — Atlanta, GA, USA [Remote]

PUBLICATIONS

- **[UG Thesis] Open-Source Combusting Flow Simulation** — **December 2024**
  Georgia Institute of Technology, Computer Science
- **[Paper] Method for scalable and performant GPU-accelerated simulation of multiphase compressible flow** — **May 2024**
  Computer Physics Communications — 10.1016/j.cpc.2024.109238
- **[Paper] Application Experiences on a GPU-Accelerated Arm-based HPC Testbed** — **September 2022**
  HPC Asia '23. International Workshop on Arm-based HPC: Practice and Experience (IWAHPCE) — 10.1145/3581576.3581621

ACADEMIC RESEARCH AFFILIATIONS

Computational Physics Group (CPG) at Georgia Tech | Multi-Component Flow Code (MFC) — **November 2021 – December 2024**

- Implemented reactive flow modeling (combustion), boundary condition patches, and many other features.
- Offloaded & Optimized the Fortran/MPI flow solver using OpenACC on leadership-class HPC systems of GPUs (OLCF Frontier & Summit).
- Modernized the codebase, adding a test suite, CI, CMake, and a custom build toolchain for case-specific compile-time optimizations.

Space Systems Design Lab (SSDL) at Georgia Tech | GT-II Satellite — **November 2021 – December 2022**

Designed & implemented the GT-II satellite's Over-The-Air update (OTA) protocols, on bare-metal, from ground systems to in-orbit handling.

EDUCATION

- **Georgia Institute of Technology** | Bachelor's in Science in **Computer Science (GPA: 3.82 "High Honor")** — **Summer 2021 – Fall 2024**
  Concentrations: **Modeling & Simulation** and **Systems & Architecture** with the **Research Option** — Atlanta, GA, USA
  Awards: **President's Undergraduate Research Award** (**PURA**) **Travel**, **Faculty Honors**, **Dean's List**, **HOPE Scholarship**
- **Lycée Lavoisier** | **Baccalauréat Général** with **High Honors** (« mention très bien ») — **July 2021**
  Concentrations: **Mathematics**, **Physics**, **Computer Science** — Paris V, France

LEADERSHIP, SERVICE, AND MISCELLANEOUS

- **Student Volunteer** at **Supercomputing 2024** | Atlanta, GA, USA [Onsite] — **November 17-22, 2024**
- **Student Volunteer** at **Supercomputing 2023** | Denver, CO, USA [Onsite] — **November 11-17, 2023**
- **Co-Chair** of the **Georgia Tech French Club** — **Fall 2022 – Fall 2024**
- **Languages: English (Native, U.S. Citizen) and French (Native, French Citizen)**

TALKS, POSTERS, AND PRESENTATIONS

- **OpenACC offloading of the MFC compressible multiphase flow solver on AMD and NVIDIA GPUs** — **November 18, 2024**
  Supercomputing 2024 (SC'24), Atlanta, Georgia, USA — Listing | Paper
- **Compressible multi-species flow simulation on OLCF Frontier via OpenACC** — **March 7, 2024**
  American Physical Society (March 2024), Minneapolis, Minnesota, USA — Abstract
- **Fast simulation of multiphase compressible flows through GPU acceleration** — **April 5, 2023**
- **A stochastic computational method for bubbly flows with first steps towards representing inception** — **April 5, 2023**
  11th International Conference on Multiphase Flow (ICMF). Kobe, Japan — Program

- **Compressible multiphase flow simulation at near-exascale via a scalable GPU implementation** **March 7, 2023**
  American Physical Society (March 2023), Las Vegas, Nevada, USA Abstract
- **Towards exascale multiphase compressible flow simulation via scalable interface capturing-based solvers…** **November 21, 2022**
  American Physical Society (November 2022), Indianapolis, Indiana, USA Abstract
- **Scalable GPU Accelerated Simulation of Multiphase Compressible Flow** **November 15, 2022**
  Supercomputing 2022 (SC'22), Dallas, Texas, USA Poster | Paper
- **Exascale for humans: A development environment for MFC** **February 19, 2022**
  Georgia Scientific Computing Symposium 2022 (GSCS 2022), Atlanta, Georgia, USA Website