

Damyn Chipman, Ph.D.

Postdoctoral Research Associate, Los Alamos National Laboratory

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Location	Los Alamos, NM

Education

2024	Ph.D. in Computing , Boise State University, Boise, ID Emphasis: Computational Sciences and Engineering Dissertation: <i>An Adaptive and Parallel Direct Solver for Elliptic Partial Differential Equations</i> Advisors: Dr. Donna Calhoun (chair)
2019	B.S. in Applied Physics , Brigham Young University, Provo, UT Emphasis: Computational Physics and Engineering Senior Thesis: <i>Aerodynamics Modeling Using a Mesh-Free Approach</i>

Research & Professional Appointments

2024–PRESENT	Postdoctoral Research Associate , <i>Los Alamos National Laboratory</i> <ul style="list-style-type: none">• Perform research and development for multiphysics code for inertial confinement fusion simulations• Maintain lab-wide C++/Fortran multiphysics codebase for users, including simulation design, debugging, and fixing issues.
2022	Defense Science and Technology Intern , <i>Lawrence Livermore National Laboratory</i> <ul style="list-style-type: none">• Implemented material interface reconstruction algorithms into multiphysics code for inertial confinement fusion simulations.• Presented project deliverables to laboratory directorate.
2021	High Energy Density Physics Intern , <i>Lawrence Livermore National Laboratory</i> <ul style="list-style-type: none">• Aligned C++ and Python nuclear data APIs for nuclear data teams.• Presented project deliverables to laboratory directorate.
2019–2021	Associate in Science , <i>Nevada National Security Site – Mission Support and Test Services</i> <ul style="list-style-type: none">• Designed experiments and analyzed data for neutron and x-ray imaging systems supporting subcritical diagnostics.• Co-authored technical reports and presentations on Site Directed Research and Development (SDRD) for portable neutron imaging system.
2018–2019	Research Assistant , <i>FLOW Lab, Brigham Young University</i> <ul style="list-style-type: none">• Investigated mesh-free aerodynamic modeling for aircraft and wind farm codes.• Presented undergraduate research at the 2019 Utah Conference for Undergraduate Research.

2016–2018 **Research Assistant**, *Advanced Power Cycles Lab, Brigham Young University*

- Designed an optimized 2- and 3-stage Rankine power plant for nuclear power applications.
- Assisted in the development of thermodynamic equation of state models.

Teaching Experience

SPRING 2024 **Graduate Teaching Assistant**, *Boise State University, Mathematics Department*

- MATH565: Parallel Computing

FALL 2023 **Graduate Teaching Assistant**, *Boise State University, Mechanical Engineering Department*

- ME273: Intro to Programming for Engineers

SPRING 2022 **Adjunct Faculty**, *Boise State University, Geophysics Department*

- GEOS357/597: Computation in the Geosciences
- Developed course curriculum, delivered remote/in-person lectures, assisted students through course

FALL 2019 **Graduate Teaching Assistant**, *Boise State University, Mathematics Department*

- MATH365: Intro to Computational Mathematics

2016–2018 **Teaching Assistant**, *Brigham Young University, Physics Department*

- Aided students during homework lab sessions for introductory to advanced physics courses
- Implemented new teaching program for 150+ student
- Oversaw sections of 20-30 students as Recitation Section Leader for undergraduate physics courses

Honors and Awards

2024 **Dean's Award** — College of Arts and Sciences, Boise State University
 2023 **Semi-Finalist** — SIAM Computational Science and Engineering Hackathon
 2020 **Hot Shot Award** — Nevada National Security Site
 2019 **Graduate Assistant Fellow** — Boise State University
 2013 **Eagle Scout** — Boy Scouts of America

Professional Development & Training

2024 **Training on AI-Driven Science on Supercomputers (20 hrs)** *Argonne National Laboratory*
 2023 **Argonne Training Program for Exascale Computing (80 hrs)** *Argonne National Laboratory*
 2021 **Advanced Numerical Methods for Hyperbolic PDEs (40 hrs)** *University of Trento, Italy*

Grants & Allocations

2023–2024 **Argonne Leadership Computing Facility Allocation** (2,500 node hours)
Scalable CPU/GPU Direct Solver for Adaptive Mesh Refinements

Publications

Peer-Reviewed Articles

- D. Chipman**, B. M. Haines, L. Kleedtke, L. Yin, R. Lester, K. Ma, D. Gatlin. *Impact of Coulomb Logarithm Model in Inertial Confinement Fusion Simulations*. (In Preparation). 2025.
- D. Chipman**, D. Calhoun, C. Burstedde. *MPI Implementation of the Quadtree-Adaptive Hierarchical Poincaré-Steklov Method*. (In Preparation). 2025.
- D. Chipman**, D. Calhoun, C. Burstedde. *A Fast Direct Solver for Elliptic PDEs on a Hierarchy of Adaptively Refined Quadtrees*. *Journal of Computational Physics* (In Review). 2025. [Link](#)
- D. Chipman**. *EllipticForest: A Direct Solver Library for Elliptic Partial Differential Equations on Adaptive Meshes*. *Journal of Open Source Software*, 9(96), 6339. 2024. [Link](#)

Technical Reports

- A. Durand, R. Freeman, **D. Chipman**, B. Garcia, M. Wallace, J. Bundaard, D. Smalley, M. Raphaelian, D. Max, D. Lowe. *High-Fidelity Dynamic Neutron Imaging and Radiography for Subcritical Experiments and Other Applications*. Technical Report, Nevada National Security Site / Mission Support and Test Services. 2020. [Link](#)

Other Publications

- D. Chipman**. *An Adaptive and Parallel Direct Solver for Elliptic Partial Differential Equations*. Dissertation, Boise State University. 2024. [Link](#)
- D. Chipman**. *Overview of Solution Methods for Elliptic Partial Differential Equations on Cartesian and Hierarchical Grids*. Comprehensive Exam Paper, Boise State University. 2022. [Link](#)
- J. Hunter, B. Hunter, **D. Chipman**, K. Jespersen, A. Imtiaz, S. Garcia, G. Cowell, and N. Price. *Forms of Energy: Kailani K. Invents All Day*. *STEMTaught Education Journal*. 2020. [Link](#)
- D. Chipman**. *Viscous Aerodynamics Modeling Using a Mesh-Free Approach*. Senior Thesis, Brigham Young University. 2019. [Link](#)

Presentations

Invited Talks

- 3) **D. Chipman**, B. M. Haines, L. Kleedtke, L. Yin, R. Lester, K. Ma, D. Gatlin. *Laser Modeling Methods for Indirect Drive Inertial Confinement Fusion*. Los Alamos – Arizona Days. 2025. Los Alamos, NM
- 2) **D. Chipman**, D. Calhoun, C. Burstedde. *A Coupled Elliptic/Hyperbolic Adaptive Finite Volume Solver for High-Performance Heterogeneous Architectures*. SIAM Pacific Northwest Conference. 2023. Bellingham, WA
- 1) **D. Chipman**, A. Durand, R. Freeman, M. Wallace, B. Garcia. *Image Processing and Reconstruction of Neutron and X-Ray Images*. NNSS Senior Leadership Team Presentation. 2019. Las Vegas, NV

Contributed Talks

- 10) **D. Chipman**, B. M. Haines, R. Lester, S. Miller, I. Gonzalez. *Conduction Solvers for Hohlraum Simulations*. American Physical Society – Division of Plasma Physics Conference. 2025. Long Beach, CA
- 9) **D. Chipman**. *Laser Physics and Solver Performance Enhancements for Inertial Confinement Fusion Simulations*. LANL Postdoc Research Seminar. 2025. Los Alamos, NM
- 8) **D. Chipman**, B. M. Haines, R. Lester, K. Ma, L. Kleedtke, L. Yin, D. Gatlin. *Improvements to Inverse Bremsstrahlung Absorption Models for Indirect Drive Inertial Confinement Fusion Simulations*. International Conference on Inertial Fusion Sciences and Applications. 2025. Tours, France
- 7) **D. Chipman**, D. Calhoun, C. Burstedde. *A Coupled Elliptic/Hyperbolic Adaptive Finite Volume Solver for High-Performance Heterogeneous Architectures*. SIAM Parallel Processing Conference. 2024. Baltimore, MD
- 6) **D. Chipman**, D. Calhoun, C. Burstedde. *A Fast, Adaptive, Matrix-Free Direct Elliptic Solver on Quadtree Meshes*. SIAM Computational Science and Engineering Conference. 2023. Amsterdam, The Netherlands
- 5) **D. Chipman**, B. Stephens. *A New Material Interface Reconstruction (MIR) Implementation in Kull*. LLNL SLAM. 2022. Livermore, CA
- 4) **D. Chipman**, G. Gert. *FUDGE and GIDI+: Aligning LLNL's Nuclear Data Codes and API*. LLNL SLAM. 2021. Livermore, CA
- 3) **D. Chipman**, D. Calhoun, C. Burstedde. *Progress Towards a Fast, Scalable, and Direct Elliptic PDE Solver for Adaptive Meshes*. SIAM Computational Science and Engineering Conference. 2021. Online
- 2) **D. Chipman**, S. Breckling. *Characterizing On-Axis X-Ray Spectra with Off-Axis Detectors*. Mission Support and Test Services Mission Directorate Presentations. 2020. Las Vegas, NV
- 1) **D. Chipman**, E. Alvarez, A. Ning. *Aerodynamic Modeling Using a Mesh-Free Approach*. Utah Conference for Undergraduate Research. 2019. Ogden, UT

Poster Presentations

- 3) **D. Chipman**, B. M. Haines, R. Lester, K. Ma, L. Kleedtke, L. Yin, D. Gatlin. *Improvements to Inverse Bremsstrahlung Absorption Models for Indirect Drive Inertial Confinement Fusion Simulations*. Anomalous Absorption Conference. 2025. Sedona, AZ
- 2) **D. Chipman**, D. Calhoun, C. Burstedde. *Adaptive Matrix Factorizations on Supercomputers*. Boise State University Research Computing Days. 2024. Boise, ID
- 1) **D. Chipman**, D. Calhoun. *Higher Order Tsunami Simulations and Novel Solution Methods*. Boise State University Graduate Student Showcase. 2021. Boise, ID