

# Damyn Chipman, Ph.D.

Postdoctoral Research Associate, Los Alamos National Laboratory

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Location	Los Alamos, NM

## Education

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

## Research & Professional Appointments

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- 2024–PRESENT    **Postdoctoral Research Associate**, *Los Alamos National Laboratory*
  - 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**, *Lawrence Livermore National Laboratory*
  - 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**, *Lawrence Livermore National Laboratory*
  - Aligned C++ and Python nuclear data APIs for nuclear data teams.
  - Presented project deliverables to laboratory directorate.
- 2019–2021    **Associate in Science**, *Nevada National Security Site – Mission Support and Test Services*
  - 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**, *FLOW Lab, Brigham Young University*
  - 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

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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

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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

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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

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

## Publications

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### 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

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### 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