

## Jordan Laune

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Chicago, IL 60637  
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### EDUCATION

*Bachelor of Arts, Physics,*  
University of Chicago, Chicago, IL.

Expected March 2019

*Bachelor of Science with Honors, Mathematics,*  
University of Chicago, Chicago, IL.

Expected March 2019

### EXPERIENCE

*Undergraduate Researcher*

Jul 2016 – Present

Flash Center for Computational Science,

Department of Astrophysics and Astronomy, University of Chicago, Chicago, IL.

- Designed and executed 2-D FLASH hydrodynamical simulations of the experiments at LULI in Gregori et al. (2012).
- Utilized Argonne National Laboratory's Mira and Cetus high-performance computing platforms to perform 2-D laser plasma simulations.
- Implemented reconstruction algorithm of Bott et al. (2017) into a Python library for experimental and simulated plasma physics diagnostics.
- Collaborated to create Python library which reads in various simulation and experimental proton radiography diagnostic data for use with reconstruction tools.
- Tested diagnostic reconstruction algorithm on the Midway compute cluster at the University of Chicago.
- Refined and developed Python module for conversion and analysis of equation of state tabulated data into FLASH Code.
- Assisted with analysis and visualization of FLASH simulation data with VisIt on Argonne's Mira supercomputer.
- Deployed open source scientific software to the community through GitHub.
- Created comprehensive API documentation for scientific Python software.
- Created user-friendly command line tools for scientific computing.

*Science Undergraduate Laboratory Internship*

Jun – Sep 2018

Nuclear, Particle, Astrophysics and Cosmology, Theoretical Division (T-2),

Los Alamos National Laboratory, Los Alamos, NM.

- Designed and executed two-fluid hydrodynamic simulations of protoplanetary disks of gas and dust with the Los Alamos Computational Astrophysics Simulation Suite (LA-COMPASS).
- Simulated millimeter-scale radio observations of protoplanetary disks using the radiative transfer code RADMC-3D.
- Utilized Los Alamos National Laboratory's high performance compute clusters for simulations and data analysis.
- Created Python analysis library built upon matplotlib and NumPy for use with the Los Alamos Computational Astrophysics Simulation Suite (LA-COMPASS).

*University of Chicago Analysis Bootcamp*

Jul – Aug 2017

Department of Mathematics, University of Chicago, Chicago, IL.

- Participated in four advanced mathematics courses lead by undergraduate teaching assistants on dynamical systems, probability theory, complex analysis, and differential geometry.
- Prepared three lectures to give to peers in the program.

University of Chicago Mathematics REU

Jun – Aug 2016

Department of Mathematics, University of Chicago, Chicago, IL.

- Participated in a five week course in graph theory and linear algebra.
- Authored expository paper on the applications of probability theory to large graphs (<https://math.uchicago.edu/~may/REU2016/REUPapers/Laune.pdf>).

## PUBLICATIONS

JT Laune, P. Tzeferacos, S. Feister, M. Fatenejad, R. Yurchack, N. Flocke, K. Weide, D. Q. Lamb. *Opacplot2: Enabling tabulated EoS and opacity compatibility for HEDLP simulations with the FLASH code* (abstract). 59th Annual Meeting of the APS Division of Plasma Physics (<http://meetings.aps.org/link/BAPS.2017.DPP.JP11.45>).

## PRESENTATIONS

*FLASH Simulations of Laser Experiments that Study Biermann Battery Generation of Magnetic Fields at LULI* (poster). JT Laune, P. Tzeferacos. 2019 NIF & JLF User Group Meeting, Livermore, CA, 3-6 Feb 2019.

*PROBLEM Solver: A nonlinear proton radiography reconstruction algorithm implemented in Python* (poster). JT Laune, A. F. A. Bott, S. Feister, A. Bogale, N. Flocke, K. Weide, T.G. White, G. Gregori, A. A. Schekochihin, D. Q. Lamb, P. Tzeferacos. 2018 Omega Laser Facility Users Group Workshop, Rochester, NY, 24-27 Apr 2018.

*PROBLEM Solver: A nonlinear proton radiography reconstruction algorithm implemented in Python* (poster). JT Laune, A. F. A. Bott, S. Feister, A. Bogale, N. Flocke, K. Weide, T.G. White, G. Gregori, A. A. Schekochihin, D. Q. Lamb, P. Tzeferacos. 2018 NIF & JLF User Group Meeting, Livermore, CA, 4-7 Feb 2018.

*Opacplot2: Enabling tabulated EoS and opacity compatibility for HEDLP simulations with the FLASH code* (poster). JT Laune, P. Tzeferacos, S. Feister, M. Fatenejad, R. Yurchack, N. Flocke, K. Weide, D. Q. Lamb. 59th Annual Meeting of the APS Division of Plasma Physics, Milwaukee, WI, 23-27 Oct 2017.

*Opacplot2: Enabling tabulated EoS and opacity compatibility for HEDLP simulations with the FLASH code* (poster). JT Laune, P. Tzeferacos, S. Feister, M. Fatenejad, R. Yurchack, N. Flocke, K. Weide, D. Q. Lamb. 2017 Omega Laser Facility Users Group Workshop, Rochester, NY, 26-28 Apr 2017.

*Opacplot2: Enabling tabulated EoS and opacity compatibility for HEDLP simulations with the FLASH code* (poster). JT Laune, P. Tzeferacos, S. Feister, M. Fatenejad, R. Yurchack, N. Flocke, K. Weide, D. Q. Lamb. 2017 Stewardship Science Academic Programs Annual, Naperville, IL, 12-13 Apr 2017.

## AWARDS

Science Undergraduate Laboratory Internship  
United States Department of Energy, Office of Science  
\$5000

Feb 2018

Second Place Undergraduate Poster Award  
2018 Omega Laser Facility Users Group Workshop  
\$150

Apr 2018

**SKILLS**

*Computer Languages & Software:* Python, Jupyter, NumPy, SciPy, matplotlib, Git, GitHub, VisIt, L<sup>A</sup>T<sub>E</sub>X, LA-COMPASS, RADMC-3D

*Languages:* English (native), German (basic reading, writing)

**MEMBERSHIPS  
IN SCIENTIFIC  
SOCIETIES**

*Student Member, High Energy Density Science Association* Sep 2017 – Present  
Organization of scientists to promote federal funding in high energy density science.

*Student Member, American Physical Society* Jul 2017 – Jul 2018  
Membership organization to promote scientific research through scientific meetings, journals, and education outreach.