

Hannah Klion

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RESEARCH INTERESTS

Computational particle methods (including particle-in-cell and Monte Carlo); high-performance computing; multiphysics simulations; magnetic reconnection; radiation transport; neutron star mergers and their optical counterparts; stellar evolution

EDUCATION

Ph.D. Physics, University of California, Berkeley Aug 2021
Dissertation: *Monte Carlo Radiation Transport Simulations of Asymmetric Neutron Star Mergers*
M.A. Physics, University of California, Berkeley May 2017
B.S. Physics, with Honor, California Institute of Technology June 2015
Minor: Computer Science

RESEARCH POSITIONS

Postdoctoral Researcher, Center for Computational Science and Engineering, Lawrence Berkeley National Laboratory 2021 - present
Graduate Student Researcher, UC Berkeley 2020 - 2021
Physics Theory Graduate Fellow, UC Berkeley 2019 - 2020
Department of Energy Computational Science Graduate Fellow, UC Berkeley 2015 - 2019
DOE CSGF Practicum, Oak Ridge National Laboratory Summer 2017
Robert L. Blinkenberg SURF, UC Berkeley (via Caltech SURF program) Summer 2014
Robert L. Blinkenberg SURF, Caltech Summer 2013
Undergraduate Researcher, Theoretical Astrophysics Group, Caltech 2012-2015
LIGO Summer Undergraduate Research Fellowship, Caltech Summer 2012

TEACHING

Graduate Student Instructor, UC Berkeley Astronomy 160: Stellar Physics Spring 2019
Teaching assistant, MESA Summer School, UC Santa Barbara 2018 & 2019

AWARDS

Rising Stars in Computational and Data Sciences 2022
Department of Energy Computational Science Graduate Fellowship 2015
UC Berkeley Physics Theory Fellowship 2015
UC Berkeley Hellman Graduate Award (*declined*) 2015
Best Poster, APS West Coast Conference for Undergraduate Women in Physics 2014

PUBLICATIONS ([ADS](#), [Google Scholar](#))

8. **H. Klion**, R. Jambunathan, M. E. Rowan, E. Yang, D. Willcox, J.-L. Vay, R. Lehe, A. Myers, A. Huebl, W. Zhang (2023) *Particle-in-Cell Simulations of Relativistic Magnetic Reconnection with Advanced Maxwell Solver Algorithms*. The Astrophysical Journal, Volume 952, Issue 1, Article ID 8.
7. **H. Klion**, A. Tchekhovskoy, D. Kasen, A. Kathirgamaraju, E. Quataert, R. Fernández (2022) *The impact of r-process heating on the dynamics of neutron star merger accretion disc winds and their electromagnetic radiation*. Monthly Notices of the Royal Astronomical Society, Volume 510, Issue 2, p. 2968.
6. **H. Klion**, P. Duffell, D. Kasen, E. Quataert (2021) *The Effects of Jet-Ejecta Interaction on 2D Kilonova Light Curves*. Monthly Notices of the Royal Astronomical Society, Volume 502, Issue 1, p. 865.
5. P. Duffell, E. Quataert, D. Kasen, **H. Klion** (2018) *Jet Dynamics in Compact Object Mergers: GW170817 Likely Had a Successful Jet*. The Astrophysical Journal, Volume 866, Issue 1, Article ID 3.
4. **H. Klion** and E. Quataert (2017) *A Diagnostic for Localizing Red Giant Differential Rotation*. Monthly Notices of the Royal Astronomical Society Letters, Volume 464, Issue 1, p. L16.

3. E. Quataert, R. Fernández, D. Kasen, **H. Klion**, B. Paxton (2016) *Super-Eddington Stellar Winds Driven by Near-Surface Energy Deposition*. Monthly Notices of the Royal Astronomical Society, Volume 458, Issue 2, p. 1214.
2. J. Fuller, **H. Klion**, E. Abdikamalov, C. D. Ott (2015), *Supernova seismology: gravitational wave signatures of rapidly rotating core collapse*. Monthly Notices of the Royal Astronomical Society, Volume 450, Issue 1, p. 414.
1. E. Abdikamalov, C. D. Ott, D. Radice, L. F. Roberts, R. Haas, C. Reisswig, P. Mösta, **H. Klion**, E. Schnetter (2015), *Neutrino-driven Turbulent Convection and Standing Accretion Shock Instability in Three-Dimensional Core-Collapse Supernovae*. The Astrophysical Journal, Volume 808, p. 70.

PRESENTATIONS & POSTERS

Peer-Reviewed Poster

H. Klion, O. E. Bronson Messer, J. Austin Harris, Thomas Papatheodore (2017) *Optimizing Gravity and Nuclear Physics in FLASH for Exascale*. Extended abstract in *Proceedings of ACM SuperComputing 17, Denver Colorado, USA, November 2017 (SC'17)*. 3 pages.

Invited Talks

Rising Stars in Computational and Data Sciences Workshop, Albuquerque, NM	April 2022
Physics and Astronomy Seminar, San Jose State University	April 2022
LBNL-LANL Collaboration Seminar, Berkeley, CA	April 2022
Center for Computational Science and Engineering Seminar, LBNL	June 2021
DOE CSGF Program Review, Arlington, VA	July 2019
KITP, UC Santa Barbara, ZTF Theory Network December Meeting	Dec 2018
KITP, UC Santa Barbara, ZTF Theory Network Summer Meeting	Aug 2018

Contributed Talks & Posters

SIAM CSE, Amsterdam, Netherlands	February 2023
LBNL, Computing Sciences Area Postdoc Symposium	February 2023
APS Division of Plasma Physics Meeting, Spokane, WA	September 2022
LBNL, Computing Sciences Area Postdoc Symposium	February 2022
UC Berkeley, Graduate Student and Postdoc Seminar	Dec 2019
Multi-Messenger Astrophysics in the Gravitational Wave Era, YITP, Kyoto	Sep 2019
Fifty-One Ergs, Raleigh, NC	May 2019
UC Berkeley, Graduate Student and Postdoc Seminar	Nov 2017
UC Berkeley, Lunch Seminar	Oct 2017
Theoretical Astrophysics in Southern California, San Diego, CA	Nov 2014

SERVICE & SYNERGISTIC ACTIVITIES

Co-Lead, LBNL Lambda Alliance Employee Activity Association	2023-present
Mentor, LBNL Director's Apprenticeship Program Data Science Project	2023-present
Event Organizer, LBNL Lambda Alliance Employee Activity Association	2021-2023
Facilitator, UC Berkeley Astronomy Antiracism Book Club	2020
Co-organizer, UC Berkeley Astronomy arXiv Discussion	2017-2019
Mentor, UC Berkeley LAGESSES Fellowship Workshop	Fall 2018
Mentor, UC Berkeley Compass Project	2016-2018

UC Berkeley Astronomy Educational Outreach

Outreach Coordinator	2018-2021
<i>Responsibilities: Developed new virtual reality and Spanish-language outreach programming. Led planning and night-of operations for Astronomy Night. Coordinated K-12 school visits to the department. Assisted in organizing yearly large (>1000 visitor) outreach events.</i>	
Lead Organizer, Astronomy Night	2018-2020
<i>Monthly public talk and stargazing event. Typical attendance was 100-200 students and community members.</i>	

Lead Organizer, UC Berkeley Astronomy Public Liaisons

2017-2018

TECHNICAL SKILLS

- Substantial experience with Python and C++
- Experience parallelizing applications with MPI and OpenMP
- Familiar with C, Fortran, Mathematica, and Unix systems