

# Hannah Klion

Lawrence Berkeley National Laboratory  
Center for Computational Science and Engineering

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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

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

## RESEARCH POSITIONS

<b>Postdoctoral Researcher</b> , Center for Computational Science and Engineering, Lawrence Berkeley National Laboratory	2021 - present
<b>Graduate Student Researcher</b> , UC Berkeley	2020 - 2021
<b>Physics Theory Graduate Fellow</b> , UC Berkeley	2019 - 2020
<b>Department of Energy Computational Science Graduate Fellow</b> , UC Berkeley	2015 - 2019
<b>DOE CSGF Practicum</b> , Oak Ridge National Laboratory	Summer 2017
<b>Robert L. Blinkenberg SURF</b> , UC Berkeley (via Caltech SURF program)	Summer 2014
<b>Robert L. Blinkenberg SURF</b> , Caltech	Summer 2013
<b>Undergraduate Researcher</b> , Theoretical Astrophysics Group, Caltech	2012-2015
<b>LIGO Summer Undergraduate Research Fellowship</b> , 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 ( <i>declined</i> )	2015
Best Poster, APS West Coast Conference for Undergraduate Women in Physics	2014

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

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
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

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
Jerusalem Winter School in Theoretical Physics (Poster), Jerusalem	Dec 2017
UC Berkeley, Graduate Student and Postdoc Seminar	Nov 2017
UC Berkeley, Lunch Seminar	Oct 2017
Massive Stars and their Explosive Outcomes (Poster), KITP, Santa Barbara, CA	Mar 2017
APS April Meeting (Poster), Baltimore, MD	Apr 2015
APS West Coast Conference for Undergraduate Women in Physics (Poster), Berkeley, CA	Jan 2015
Theoretical Astrophysics in Southern California, San Diego, CA	Nov 2014

## SERVICE & SYNERGISTIC ACTIVITIES

Co-Investigator on submitted 2022-23 ALCC Proposal	present
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 (&gt;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