Hannah Klion

Lawrence Berkeley National Lab — M/S 50A-3111, 1 Cyclotron Rd, Berkeley, CA 94720
Center for Computational Science and Engineering — klion@lbl.gov — https://www.klion.org

Research Interests

Computational particle methods; magnetic reconnection; radiation transport; Monte Carlo methods; high-performance computing; 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 Lab — 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
Advisor: Bronson Messer
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

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)

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

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

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
Caltech Summer Undergraduate Research Fellowship Seminar	Oct 2014
Theoretical Astrophysics in Southern California, Los Angeles, CA	Dec 2013
Caltech Summer Undergraduate Reserach Fellowship Seminar	Oct 2013
Theoretical Astrophysics in Southern California, Pasadena, CA	Nov 2012
LIGO Summer Undergraduate Research Fellowship Seminar, Livingston, LA	Aug 2012

Service

Facilitator, UC Berkeley Astronomy Antiracism Book Club	2020
Co-organizer, UC Berkeley Astronomy arXiv Discussion	2017-2019
Mentor, UC Berkeley LAGSES Fellowship Workshop	Fall 2018
Mentor, UC Berkeley Compass Project	2016-2018

UC Berkeley Astronomy Educational Outreach

Outreach Coordinator — 2018-present

Responsibilities: Develop new virtual reality and Spanish-language outreach programming. Lead planning and night-of operations for Astronomy Night. Coordinate K-12 school visits to the department. Assist in organizing yearly large (>1000 visitor) outreach events.

Lead Organizer, Astronomy Night — 2018-2020

Monthly public talk and stargazing event. Typical attendance is 100-200 students and community members. On hiatus due to COVID-19.

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