

Hannah Hasson

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<https://hrhasson.github.io/>

EDUCATION

University of Rochester

Ph.D in Physics & Astronomy

August 2023

Dissertation: A Novel Pulsed-Power Experiment for Exploring the Effect of Magnetic Field Geometry and Flow Rotation on Plasmas Emulating Protostellar Jets

Master of Arts in Physics & Astronomy

May 2021

University of Texas at Austin

Bachelor of Science in Physics, Bachelor of Science in Astronomy

May 2018

Special Honors in Astronomy

Overall GPA: 3.68/4.0

TECHNICAL STRENGTHS

Computer Languages

Python, Mathematica, MATLAB, Bash, Slurm, basic HTML & basic Fortran

Software & Tools

VisIT, LaTeX, ImageJ, Inventor/AutoCAD, PERSEUS (MHD), SCRAM, PrismSPECT, Excel

Hard skills

Soldering, mill, lathe, drill press, basic and high-voltage electronics, operating high-power optical lasers, alignment of optical systems, cable stripping and connection, assembly of fine wire targets

Communication

Comfortable with public speaking, intermediate Spanish speaker

RESEARCH EXPERIENCE

Sandia National Laboratories

Postdoctoral Researcher under M.R. Gomez

Dec 2023 - present

Albuquerque, NM

- Oversaw shot planning and execution as experimental PI on 8 shots on Z accelerator facility
- Led 2 experimental campaigns on Mykonos driver and 2 campaigns on COBRA driver
- Simulating atomic spectra with SCRAM code to process x-ray spectroscopy data

University of Rochester Physics & Astronomy Dept

August 2018 - August 2023

Graduate Research Assistant under P. Gourdain

Rochester, NY

- Planned and led 5 plasma outflow experiments on Cornell's COBRA driver
- Simulated pulsed power accretion outflows experiment with 3D PERSEUS MHD code
- Constructed shearing interferometer/shadowgraph diagnostic in Gourdain lab

Sandia National Laboratories

June - August 2019

Albuquerque, NM

Graduate Research Intern under C. Myers

- Wrote MATLAB scripts to test b-dot calibration methods for Z Machine
- Assisted in constructing shadowgraphy plasma diagnostic for Mykonos driver

University of Texas Astronomy Department

August 2016 - August 2018

Undergraduate Researcher under K. McQuinn

Austin, TX

- Observed for 3 nights on the 107" telescope at McDonald Observatory
- Used IRAF code to reduce CCD image data and calculate star formation rates of dwarf galaxies

- Built and tested novel scintillator gamma-ray spectrometer
- Collected spectral data and served as co-lead for positron experiment at Texas Petawatt Laser
- Conducted filter stack spectrometer calibration tests with Na-22 source

TEACHING & OUTREACH

Computational Research Access NEtwork (CRANE) Dec 2021 - present
Co-founder, curriculum developer, lecturer, chair of executive board

- Co-developing lessons and program structure for semester-long python-based computational physics methods workshop for undergrads
- Taught two-hour lectures on basic Python and computational methods to 358 students
- Mentoring students and helping them apply for paid research internships
- Distributed over \$85k in stipends to 56 student participants demonstrating need
- See www.cranephysics.org

Gourdain lab summer high school internship program August 2020, July 2021, July 2022
Program lead, curriculum developer, project mentor University of Rochester

- Co-designed month-long introduction to research curriculum with I. West-Abdallah (see <https://hrhasson.github.io/outreach.html>)
- Developed and taught three-day introductory Python course (see <https://github.com/hrhasson/>)
- Mentored pairs of high school students through experimental laser diagnostic projects

Center for Matter at Atomic Pressures (CMAP) Summer School August 2021
Lecturer University of Rochester

- Led 3 hour workshop on simulating a simple accretion-to outflow system in 2D hydrodynamics with python

PHY 122P (Electricity & Magnetism), PHY 121P (Mechanics) August 2018 - May 2019
Graduate Teaching Assistant University of Rochester

- Head TA for two semesters of flipped-classroom undergraduate introductory physics courses. Worked one-on-one teaching students, graded exams, met with students needing guidance

AST 307 (Intro Astronomy) Fall 2017
Undergraduate teaching assistant University of Texas at Austin

- Provided in-class assistance for students
- Shared grading of assignments and exams with graduate TA

FUNDED GRANT PROPOSALS

*NSF Career Award Addendum Proposal for the Computational Research Access Network (CRANE)
\$94194 awarded for 2022-2024*

D Schaffner, H Hasson, N Vazirani, S Humane, L Horimbere, A Hayes, S Negussie.

HIGHLIGHTED PUBLICATIONS

HR Hasson et al., "Current switching in dual parallel loads at 1 MA," *Physics of Plasmas* (In preparation)

HR Hasson et al., "Radial-to-Axial Flows in a Scaled Pulsed-Power Scheme for Producing Outflows Resembling YSO Jets," *Journal of Plasma Physics* (2024)

EG Kostadinova, S Greco, M Murdock, E Barraza-Valdez, HR Hasson et al., "Workforce Development Through Research-Based, Plasma-Focused Activities," *Physics of Plasmas* (2023)

E Liang, KQ Zheng, K Yao, W Lo, H Hasson et al., "A Scintillator Attenuation Spectrometer For Intense Gamma-Rays," *Review of Scientific Instruments* (2022)

HR Hasson et al., "Design of a 3-D Printed Experimental Platform for Studying the Formation and Magnetization of Turbulent Plasma Jets," *IEEE Transactions on Plasma Science* (2020)

E Liang, T Clarke, ... H Hasson et al., "High e+/e- ratio dense pair creation with 10^{21} W.cm⁻² laser irradiating solid targets," *Nature Scientific Reports* (2015)

SELECTED PRESENTATIONS

Enhancing dI/dt via current switching using parallel targets on the Z facility

Poster presented at the 2025 Inertial Fusion Sciences and Applications conference

Development and optimization of an x-pinch radiograph capability for the Z Machine

Poster presented at the 2024 APS Division of Plasma Physics conference

Rotating Plasma Outflows with Tunable Magnetic Fields Resembling YSO

Poster presented at the 2024 High Energy Density Laboratory Astrophysics (HEDLA) Conference

Promoting BIPOC and Marginalized Students to Pursue Computational Physics through CRANE

Invited talk presented with I. West-Abdallah at the 2023 Omega Laser User Group (OLUG) conference and contributed talk presented at the 2022 APS Division of Plasma Physics conference

Experimental Results from a Pulsed-Power Platform to Study Accretion-Driven Astrophysical Outflows

Invited talk presented at the 2022 Z Fundamental Science Workshop conference

A Study of Magnetized Jet Stability Using High Energy Density Plasmas

Invited talk given at the 2019 Pulsed Power and Plasma Science conference

AWARDS & HONORS

Laboratory for Laser Energetics Horton Graduate Fellowship

Fall 2022- Spring 2023

High Energy Density Laboratory Astrophysics Conference student poster award

May 2022

CUWIP University of Kansas research poster award

Jan 2018

CUWIP Rice University research poster award

Jan 2017

LEADERSHIP

Physics & Astronomy Department DEI committee

Committee member

August 2021 - July 2023

University of Rochester

- Meet monthly with faculty about department policies to improve department culture and resources for marginalized students

Physics & Astronomy Graduate Student Association

Secretary, President

August 2019 - July 2022

University of Rochester

- Successfully advocated for department to handle payment of student healthcare
- Conducted events for career development, outreach, and community building among physics graduate students
- Assisted the department's Graduate Admissions Committee with recruiting weekend for admitted students
- Served on the department's Diversity, Equity and Inclusion committee

Graduate Women of Physics and AStronomy (WoPAS)

Board Member

October 2018 - Aug 2021

University of Rochester

- Organizing mentorship and community among women graduate students in physics