

# Hannah Hasson

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

## EDUCATION

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### 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

May 2018

Bachelor of Science in Physics, Bachelor of Science in Astronomy

Overall GPA: 3.68/4.0

Special Honors in Astronomy

## TECHNICAL STRENGTHS

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<b>Computer Languages</b>	Python, Mathematica, MATLAB, Bash, Slurm, basic HTML & basic Fortran
<b>Software &amp; Tools</b>	VisIT, LaTeX, ImageJ, Inventor/AutoCAD, PERSEUS (MHD), SCRAM, PrismSPECT, Excel
<b>Hard skills</b>	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
<b>Communication</b>	Comfortable with public speaking, intermediate Spanish speaker

## RESEARCH EXPERIENCE

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### Sandia National Laboratories

Dec 2023 - present

*Postdoctoral Researcher under M.R. Gomez*

*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

*Graduate Research Intern under C. Myers*

*Albuquerque, NM*

- 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

## Rice University Physics & Astronomy Department

*Undergraduate Researcher under E. Liang*

June 2014 - Jan 2018

*Houston, TX*

- 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

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### 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](http://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

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*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

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- 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<sup>-2</sup> laser irradiating solid targets,” *Nature Scientific Reports* (2015)

## SELECTED PRESENTATIONS

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- 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

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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

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<b>Physics &amp; Astronomy Department DEI committee</b> <i>Committee member</i>	August 2021 - July 2023 <i>University of Rochester</i>
· Meet monthly with faculty about department policies to improve department culture and resources for marginalized students	
<b>Physics &amp; Astronomy Graduate Student Association</b> <i>Secretary, President</i>	August 2019 - July 2022 <i>University of Rochester</i>

- 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