

Henna Abunemeh

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Research Interests

Observational Cosmology • Supernova Spectroscopy and Standardization • Time-Domain and Transient Astrophysics
Statistical Inference • Machine Learning for Survey Science • Big Data

Education

Expected 2030	University of Illinois Urbana-Champaign <i>Ph.D. Student, Department of Astronomy</i>	Champaign, Illinois
2024	University of Illinois at Chicago <i>B.S. in Physics, Minor in Mathematics</i>	Chicago, Illinois

Research Experience

Research Assistant

August 2024 – Present

Advisor: Dr. Gautham Narayan

- Conduct research on Type Ia supernova spectroscopy and standardization in support of cosmological constraints on dark energy with the Vera C. Rubin Observatory Legacy Survey of Space and Time (LSST).
- Develop methods to identify spectroscopic twins of supernovae using large heterogeneous spectral datasets, with applications to improved standardization, population studies,
- Apply and evaluate automated classification tools, including Astrodash, for supernova identification and screening in large spectroscopic samples.

Science Undergraduate Laboratory Internship, Argonne National Laboratory

August 2023 – December 2023

Advisor: Dr. Lindsey Bleem

Undergraduate Researcher

- Tested cosmological models using CMB-S4 galaxy clusters identified via the SZ effect, analyzing selection biases from foreground contamination, spectral band choice, and noise in Argonne simulations.

IDEAS Summer School REU, University of Illinois Urbana-Champaign

June 2023 – July 2023

Advisor: Dr. Gautham Narayan

Undergraduate Researcher

- Conducted spectroscopic analysis of supernovae to study transient diversity and population structure using Gemini Observatory data.
- Classified supernovae and transients using SNID and Astrodash.

Observing Experience

AstroNotes: 2023-1, 2023-2

Teaching Experience

University of Illinois Urbana-Champaign

Teaching Assistant, Department of Astronomy

ASTR 210 – Introduction to Astrophysics

August 2024 – May 2025

Professional Affiliations

The LSST Transient & Variable Stars Collaboration (TVS)	June 2025 – Present
American Astronomical Society	Member since November 2023 – Present
Young Supernova Experiment (YSE)	June 2023 – Present

Contributed Posters and Presentations

- Poster: *Studying Supernova Uniqueness and Population Diversity with Spectroscopy*
243rd Meeting of the American Astronomical Society
- Talk: *Examining Galaxy Cluster Selection in CMB: Simulations and Analysis*
December 5, 2023 – Argonne National Laboratory Internship Symposium
- Talk: *Studying Supernova Uniqueness and Population Diversity with Spectroscopy*
July 28, 2023 – Astro Summer Symposium, University of Illinois Urbana-Champaign
- Poster: *Studying Supernova Uniqueness and Population Diversity with Spectroscopy*
July 26, 2023 – Illinois Summer Research Program Alliance, University of Illinois Urbana-Champaign

Publications

[1] ***Picture an Astronomer: Best Practices for Retaining Talent in Astrophysics***

A. Polzin, K. E. Whitaker, + 86 authors incl. **H. Abunemeh**
arXiv:2512.24465 (2025)

[2] ***A Panchromatic View of Late-time Shock Power in the Type II Supernova 2023ixf***

V. V. Jacobson-Galán, L. Dessart, C. D. Kilpatrick, P. J. Patel, K. Auchettl, S. Tinyanont, R. Margutti, V. V. Dwarkadas, K. A. Bostroem, R. Chornock, R. J. Foley, **H. Abunemeh**, T. Ahumada, P. Arunachalam, M. J. Bustamante-Rosell, D. A. Coulter, C. Gall, H. Gao, X. Guo, J. Hjorth, D. O. Jones, M. Kaewmookda, M. M. Kasliwal, R. Kaur, C. Larison, N. LeBaron, H.-Y. Miao, G. Narayan, Y.-C. Pan, S. H. Park, K. C. Patra, Y. Qin, C. L. Ransome, A. Rest, J. Rho, S. Rose, H. Sears, J. J. Swift, K. Taggart, V. A. Villar, Q. Wang, Y. Zenati, H. Zhou
Astrophysical Journal Letters, 994, L14 (2025)

[3] ***Spectral Diversity in Type Ibn Supernovae and the Large Host Offset of SN 2024acyl***

Y. Dong, V. A. Villar, A. Nugent, G. Hosseinzadeh, R. J. Foley, C. Gall, M. Gallegos-Garcia, C. Ransome, A. Sedgewick, D. Tsuna, S. Valenti, **H. Abunemeh**, M. Andrews, K. Auchettl, K. A. Bostroem, D. A. Coulter, T. de Boer, K. de Soto, D. A. Farias, J. Farah, D. Frostig, H. Gao, A. Gagliano, E. Hoang, D. A. Howell, W. B. Hoogendam, M. E. Huber, D. O. Jones, C.-C. Lin, M. Lundquist, C. McCully, D. Mehta, A. L. Piro, A. P. Ravi, N. Meza Retamal, C. Rojas-Bravo, S. K. Yadavalli, Q. Wang
arXiv:2511.03926 (2025)

Honors and Awards

- **Undergraduate Honors: High Distinction, Spring 2024**
- **Inder P. and Uma Batra Memorial Physics Undergraduate Award for Fine Academic Achievement, Spring 2024**
- **Dean's Award for Academic Excellence, Fall 2023 & Spring 2024**

Leadership, Service, and Outreach

LSST DESC Collaboration Meeting at UIUC, Local Organization Committee, 2025

- Contributed to logistics by producing maps, supporting AV operations, and assisting with on-site session coordination throughout the meeting.

UIUC Astronomy Department, Girls Astronomy Summer Camp, Co-Director, 2025

- Co-directed a week-long outreach program introducing high school students to astronomy through hands-on activities, coding projects, and interactive lectures.
- Managed day-to-day operations, developed curriculum content, supervised staff and counselors, and coordinated closely with faculty and department leadership.

Astronomy Conversations, Adler Planetarium in Chicago

- Volunteer since August 2024; engage with public visitors to answer astronomy questions and spark science conversations.

UIC Physics Club, President, 2022–2024

- Directed club activities including meetings, hands-on workshops, and mentoring underclassmen through peer-led academic support initiatives.
- Expanded membership and campus presence by facilitating collaborations with astronomy and engineering groups and developing outreach events across the greater Chicago area.

UIC Chapter of the Society of Physics Students, 2022–2024

- Elected President 2023–2024; focused on strengthening campus visibility through cross-organization collaborations and community outreach, including co-hosted events with STEM groups and local science engagement initiatives.

UIC Astronomy Club Observatory Construction Project

- Initiated in 2022; supported the project through planning, logistics, and funding efforts until its completion in 2025.
- Current expansion efforts focus on upgrading instrumentation and broadening student access.

Skills

Computer Programming and Data Analysis:

- Python, Bash, Mathematica
- Git, Docker
- Spectroscopic Data Reduction with PyRAF
- Spectroscopic Data Reduction with DRAGONS
- SAOImage DS9

Document Editing:

- \LaTeX , Microsoft Office, Google Workspace

Languages:

- English (Native)
- Arabic (Levantine & MSA, Full Professional Proficiency)

Frameworks and Tools:

- Jupyter, VS Code, Obsidian