

Molly Wolfson

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Education

University of California, Santa Barbara (UCSB) Santa Barbara, CA
– Physics M.A. 2021; Physics Ph.D. 2024

The University of Chicago Chicago, IL
– Physics B.A. with honors; Mathematics B.S. 2018

Research Experience

2025–present: **President’s Postdoctoral Scholar**, OSU, Columbus, OH

2024–present: **CCAPP Fellow**, OSU, Columbus, OH

2018–2024: **Graduate Student Researcher**, UCSB, Santa Barbara, CA
PI: Professor Joseph Hennawi

2017: **NSF Mathematics REU Participant**, UChicago, Chicago, IL
<http://math.uchicago.edu/~may/REU2017/REUPapers/Wolfson.pdf>

2017–2018: **Research Assistant**, Enrico Fermi Institute, Chicago, IL
PI: Professor Yau Wah

2016: **DHS Summer Research Intern**, NSTec, Las Vegas, NV
Supervisor: Dr. Eric Wagner

2015-2017: **Research Assistant**, James Franck Institute, Chicago, IL
PI: Professor Stuart A. Rice and Dr. Binhua Lin

First Author Publications

1. **Wolfson, M.**, Hennawi, J. F., Davies, F. B., Lukić, Z., Oñorbe, J. “Forecasting constraints on the high- z IGM thermal state from the Lyman- α forest flux auto-correlation function” 2025, MNRAS, 540 (2), 1412-1431
2. **Wolfson, M.**, et al. “Measurements of the $z > 5$ Lyman- α forest flux auto-correlation functions from the extended XQR-30 data set” 2024, MNRAS, 531 (3), 3069-3087
3. **Wolfson, M.**, Hennawi, J. F., Davies, F. B., Oñorbe, J. “Forecasting constraints on the mean free path of ionizing photons at $z \geq 5.4$ from the Lyman- α forest flux auto-correlation function” 2023, MNRAS, 521 (3), 4056-4073
4. **Wolfson, M.**, Hennawi, J. F., Davies, F. B., Oñorbe, J., Hiss, H., Lukić, Z. “Improving IGM temperature constraints using wavelet analysis on high-redshift quasars” 2021, MNRAS, 508 (4), 5493-5513
5. **Wolfson, M.**, Liepold, E. R., Lin, B., and Rice, S. A. “A comment on the position dependent diffusion coefficient representation of structural heterogeneity” 2018, J. Chem. Phys., 148 (19), 194901

Selected Contributing Author Publications

1. González-Hernández, D., Doughty, C., **Wolfson, M.**, Hennawi, J. F., Jin, Z. “Using Neural Emulators and Hamiltonian Monte Carlo to constrain the Epoch of Reionization’s History with the Ly α Forest Power Spectrum” 2025, arXiv:2509.13498

2. Brodzeller, A., **Wolfson, M.**, et al. “Construction of the damped Ly α absorber catalog for DESI DR2 Ly α BAO” 2025, Phys. Rev. D, 112 (8), 083510
3. Jin, Z., **Wolfson, M.**, Hennawi, J. F., González-Hernández, D., “Neural network emulator to constrain the high- z IGM thermal state from Lyman- α forest flux auto-correlation function” 2025, MNRAS, 536 (3), 2277-2293

Selected Collaboration Papers

1. DESI Collaboration including **Wolfson, M.**, “DESI DR2 results. II. Measurements of baryon acoustic oscillations and cosmological constraints” 2025, Phys. Rev. D, 112 (8), 083515
2. DESI Collaboration including **Wolfson, M.**, “DESI DR2 results. I. Baryon acoustic oscillations from the Lyman alpha forest” 2025, Phys. Rev. D, 112 (8), 083514
3. DESI Collaboration including **Wolfson, M.**, “Data Release 1 of the Dark Energy Spectroscopic Instrument” 2025, arXiv:2503.14745
4. XQR-30 Collaboration including **Wolfson, M.**, “XQR-30: the ultimate XSHOOTER quasar sample at the reionization epoch” 2023, MNRAS, 523 (1), 1399-1420

Conference Proceedings

1. González-Hernández, D., **Wolfson, M.**, Hennawi, J. F., “Reliable Parameter Inference for the Epoch of Reionization using Balanced Neural Ratio Estimation” Machine Learning and the Physical Sciences Workshop at NeurIPS, December 6th, 2025, San Diego, CA, arXiv:2511.02808
2. González-Hernández, D., **Wolfson, M.**, Hennawi, J. F., “Accelerating statistical inferences in astrophysics with Neural Networks and Hamiltonian Monte Carlo” 2024 ICML Workshop on Structured Probabilistic Inference & Generative Modeling, Vienna, Austria, <https://openreview.net/forum?id=uKxqQ4DoFE>

Awards and Honors

OSU President’s Postdoctoral Scholar	2025-2027
Worster Summer Research Fellowship	2023
Doctoral Student Travel Grant	2023
Mananya Tantiwivat Fellowship Award	2022
UCSB Department of Physics, Department Service Award	2018-2020
University of Chicago Dean’s List	2014-2018
Enrico Fermi Institute Undergraduate Summer Research Grant	2017
UCISTEM Summer Research Grant	2015

Research Talks

Invited

2026	Galaxies Seminar at the University of Michigan, March 9, 2026, Ann Arbor, MI
2024	OSU Center for Cosmology and AstroParticle Physics Seminar, June 24, 2024, Columbus, OH
2023	UC Berkeley Cosmology Seminar, October 31, 2023, Berkeley, CA
2022	UC Berkeley Cosmology Seminar, October 18, 2022, Berkeley, CA

Contributed

- 2026 *Towards the Full Bloom of First Star, Galaxy, and Black Hole Formation Exploration*, March 23-27, Tokyo, Japan
- 2025 DESI Collaboration Meeting, December 8 - 12, 2025, Tucson, AZ, USA
- 2025 *Cosmo-25*, October 13-17, 2025, Pittsburgh, PA
- 2025 IFAE Seminar, September 29, 2025, Institut de Física d'Altes Energies, Barcelona, Spain
- 2025 *Lyman- α forest full shape analysis with DESI Year 3*, September 22-24, 2025, Columbus, OH
- 2025 CCAPP Symposium, September 17-18 2025, Columbus OH
- 2024 DESI Collaboration Meeting, December 10-13, 2024, Cancun, Mexico
- 2024 Lyman- α Workshop, October 10-11, 2024, Columbus, OH
- 2024 CCAPP Symposium, September 25-26, 2024, Columbus, OH
- 2024 *243th Meeting of the American Astronomical Society*, January 7-11 2024, New Orleans, LA
- 2023 MIT Monday Afternoon Talk, July 10, 2023, Cambridge, MA
- 2023 *Reionization in the Summer*, June 26 - 29, 2023, Heidelberg, Germany
- 2023 UCSB Astro Lunch Seminar, May 31, 2023, Santa Barbara, CA
- 2023 *Future Cosmology*, April 23 - 29, 2023, IESC Cargese, France
- 2022 *240th Meeting of the American Astronomical Society*, June 12-16 2022, Pasadena, CA
- 2022 *Reionization and Cosmic Dawn: Looking Forward to the Past*, March 21 - 23, 2022, BCCP Berkeley, CA

Teaching and Supervision

- Summer 2025: **Summer Undergraduate Research Program (SURP) Mentor** Ohio State University
Supervised Brandon Lam (undergrad)
- 2022–present: **Research Mentor** University of California, Santa Barbara
Supervised Diego González-Hernández (continuing PhD student)
Resulted in publication González-Hernández et al. (2025) and two conference proceedings
- 2022–2024: **Research Mentor** University of California, Santa Barbara
Supervised Linda (Zhenyu) Jin (undergrad, now PhD student at University of Washington)
Resulted in publication Jin et al. (2025)
- 2018–2019: **Teaching Assistant** UCSB Department of Physics
PHYS 3L (now 20AL), PHYS 4L (now 20BL) - introductory labs for physics majors
- 2016–2018: **Research Mentor** James Franck Institute
Trained and supervised Linsey Nowack (undergrad)
- 2016–2018: **Physics Core Tutor** The University of Chicago Harper Library
Covered introductory physics course material and beyond

Synergistic Activities

1. Professional Service:

- (i) Organizer, “Cosmo Lunch”, journal club, OSU, Columbus, OH, 2025 - present
- (ii) SOC Member, “Lyman- α forest full shape analysis with DESI Year 3” multi-node meeting, OSU, Columbus, OH, 2025
- (iii) Organizer, “CCAPP Seminar” talk series, OSU, Columbus, OH, 2024-2025
- (iv) SOC Member, “Lyman- α Workshop” OSU, Columbus, OH, 2024

- (v) Organizer, “Astro Lunch” talk series, UCSB, Santa Barbara, CA 2019 - 2024
- (vi) LOC Member, “Beyond Academia Conference” UCSB, Santa Barbara, CA, 2020 - 2021
- (vii) LOC Member, “APS Conference for Undergraduate Women in Physics” UCSB, CA, 2018 - 2019

2. Collaborations:

- (i) Member, the DESI collaboration, 2024 - present
- (ii) Co-Investigator, GHOSTLY, 2024 - present <https://www.gemini.edu/observing/phase-i-proposing-time/llp/approved-llps/ghostly-quasar-sample>
- (iii) Member, the XQR-30 team, 2021 - present <https://xqr30.inaf.it/>

3. Public Talks:

- (i) “Exploring the Epoch of Reionization through High-Redshift Quasars” FOSAA, October 26, 2025
- (ii) “Cosmology 101” for OSU ASPIRE, June 16-20, 2025
- (iii) “Cosmic Lighthouses: Navigating the Early Universe with Quasars”, UCSB Grad Slam, March 12, 2023
- (iv) “The History of the Universe with High-Redshift Quasars”, UCSB Lunch & Learn, June 2, 2023

4. UCSB Service:

- (i) Mentor, Graduate Scholars Program, 2020 - 2024
- (ii) Member, Women and Gender Minorities in Physics, 2018 - 2024
- (iii) President, Women and Gender Minorities in Physics, 2019 - 2022
- (iv) Mentoring Chair, GradLife, 2019 - 2021
- (v) Co-Author, APS Bridge Partnership Institution Application, 2020 - 2021
- (vi) Mentor, Women in Science and Engineer Mentoring Program, 2018 - 2019

5. Invited Panels:

- (i) OSU ASPIRE Graduate School Panel, June 2025
- (ii) “Being a Woman in Physics” UCSB SPS, 2021
- (iii) “Applying to Graduate School and Fellowships” APS CUWiP, 2019
- (iv) “Exploring Undergraduate Research Opportunities” UCSB Dept. of Physics, 2018