Ava E. Polzin

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Education

Ph.D. in Astronomy & Astrophysics, **The University of Chicago** exp. 2026
Advisors: Profs. Andrey Kravtsov and Hsiao-Wen Chen

M.S. and M.Phil. in Astronomy (en route), **Yale University** Dec. 2022
Transferred to UChicago post-candidacy

B.A. in Physics with honors (concentration in Astronomy), **Northwestern University** Dec. 2018
Thesis: "Exploring the Eclipsing Binary Yield of the Large Synoptic Survey Telescope" with Prof. Aaron Geller
Minor in Earth & Planetary Sciences (concentration in Geophysics)

Research Experience

The University of Chicago Chicago, IL
Graduate Research Assistant, Structure Formation Group and Chen Group 2022–Present
- Theory/computation and observation; advisors: Profs. Andrey Kravtsov and Hsiao-Wen Chen
- Focusing on star formation and the baryon cycle in dwarf galaxies/low metallitic galaxies.

Yale University New Haven, CT
Graduate Research Assistant, Newburgh and van Dokkum groups 2019–2022
- Departments of Astronomy and Physics, advisors: Profs. Laura Newburgh and Pieter van Dokkum
- Observational, extragalactic and cosmology research using data from the Canadian Hydrogen Intensity Mapping Experiment (CHIME) and the Dragonfly Telephoto Array.

Visiting Undergraduate Researcher, Newburgh Lab, Department of Physics Summer 2018
- Experimental cosmology research, instrumentation; advisor: Prof. Laura Newburgh
- Examined the feasibility of using drones for calibration and beam-mapping of static Hydrogen Intensity and Real-time Analysis eXperiment (HIRAX) – and CHIME – dishes.

Northwestern University Evanston, IL
Research Assistant, Margutti Group January–July 2019
- X-ray duration-luminosity phase space; advisor: Prof. Raffaella Margutti
- Worked on comprehensive review of soft X-ray transients and variables to define discovery space for upcoming missions and generate a resource to allow for initial, qualitative classification of transient signals.

Vera Rubin Observatory Intern 2017–2019
- Time-domain astronomy, simulations; advisor: Prof. Aaron Geller
- Created a Galactic simulation to determine a new minimum prediction for Rubin Observatory's eclipsing binary yield over its ten-year run.

Undergraduate Research Assistant, Micro-X Lab 2016–2017
- High-energy astroparticle physics, instrumentation; advisors: Prof. Enectali Figueroa-Feliciano, Dr. David Goldfinger, and Dr. Antonia Hubbard
- Primarily worked on Transition Edge Sensors and simulated the helium consumption of the lab's dewars in advance of sounding rocket launch.

University of Southern California Los Angeles, CA
Undergraduate Research Volunteer, Nealson Lab Spring 2016
- Environmental microbiology, geological sciences; advisors: Prof. Ken Nealson, Dr. Casey Barr
- Intended as training for planned research in environmental microbiology scheduled to be carried out at the Jet Propulsion Lab, Pasadena, CA, Summer 2016. In addition to setting up electrochemical tests, general biology lab experience – making plates, mixing media, isolating samples for re-plating, organizing and cataloging chemical shelves, etc.

Instructional Experience

Teaching

- **CCTL (Senior) Graduate Fellow**, Chicago Center for Teaching and Learning (CCTL) 2023–Present
  Develop and deliver instruction and programming related to teaching and pedagogy at the University of Chicago. Senior Fellow from May 2024.
- **Lead Instructor**, Yale Young Global Scholars Summers 2020–2022
  - Design and implement seminars about astrophysics and the history of astrophysics targeted at advanced high school students (e.g., "Introduction to Extragalactic Astrophysics" and "Astronomy Sans the White Dudes".)
  - Invited to deliver sample seminar for new instructors, "Introduction to Extragalactic Astrophysics," at YYGS Spring Training (March 5, 2022). Included analysis of seminar design and presentation.
  - Evaluations are linked: 2020, 2021, and 2022
- **Certificate of College Teaching Preparation**, Yale Poorvu Center for Teaching & Learning May 2022
  Meets the requirements for CIRTL Associate, as well.
- **Graduate Teaching Fellow**, Yale University 2019–2021
  - ASTR 110 (Planets & Stars) with Dr. Michael Faison, Fall 2019 (4.6/5.0)
  - ASTR 170 (Introduction to Cosmology) with Prof. Priya Natarajan, Spring 2020 (N/A due to COVID-19)
  - ASTR 110 (Planets & Stars) with Dr. Michael Faison, Fall 2020 (4.7/5.0)
  - ASTR 255/PHYS 295 (Research Methods in Astrophysics) with Prof. Héctor Arce, Fall 2021 (4.1/5.0)
- **Teaching Assistant**, Yale Summer Program in Astrophysics Summers 2019 and 2020
  Mentor students in their research projects, aid with assignments (both in a tutoring capacity and a grading one), and serve as telescope Time Allocation Committee (TAC). During Summer 2019, oversaw/ran nightly observing sessions at the Leitner Family Observatory and Planetarium.
- **Grader**, Northwestern University Department of Physics & Astronomy Winter 2019
  Graded assignments for Physics 330-2 (Classical Mechanics) with Prof. Nathaniel Stern, Winter 2019.
- **Peer-Guided Study Group Facilitator**, Northwestern University 2017–2019
  Through Academic Support and Learning Advancement (Searle Center for Advancing Learning & Teaching, Weinberg College).
  - Led small group sessions supplemental to general physics courses. Worked with Prof. David Taylor's and Prof. Art Schmidt's classes for Fall 2017 and Prof. Deborah Brown's classes Winter 2018 to Spring 2019.
  - Invited to serve on student panel at annual ASLA New Faculty Workshop (September 21, 2018) and returning student leader panel at annual Peer Leader Training (September 26, 2018).
- **N'Cat Tutor**, Northwestern Athletics, Northwestern University 2017–2019
  Tutored student athletes in physics, astronomy, math, music, and earth science courses. Worked both one-on-one and with groups.
- **Learning Assistant**, Searle Center for Advancing Learning & Teaching, Northwestern University Spring 2018
  Attended all lectures and discussions to provide TA-like support to students during introductory physics class. Participated in Prof. Zosia Krusberg's Physics 135-3 pilot of the Learning Assistant program.

Additionally, I maintain astroteaching.github.io, where I have aggregated various open source course materials and visualizations/resources to make them easier for other instructors to find and use, and I created a pedagogical text for students looking to pursue astrophysics professionally, *Astronomy as a Field: A Guide for Aspiring Astrophysicists*.

Research mentorship

Undergraduates:

- Vicky Bardon Soto (University of Chicago '27) May 2024–Present
  Analyzing spatially resolved optical spectra of low-mass dwarf galaxies
- Catherine Mah (Hong Kong University '25, exchange student at UChicago) March–October 2024
  Recovering photometry and structural properties for a diverse sample of dwarf galaxies

I have also been the primary research mentor for a number of high school students conducting independent study projects spanning a range of topics in astrophysics (a full list of students and projects is on my website) For example:

- Jack Phelps (Windward School, Princeton Astrophysics '29) January–October 2024
  Measurement of Galactic 21 cm emission with homemade setup (arXiv)

Leadership & Service

- **Reviewer** for JOSS, PASP
- **UChicago Representative, Astronomy Graduate Student Congress** 2023–Present
- **Community Engagement Working Group**, UChicago Astrophysics 2022–Present
- **Faculty Meeting Notetaker**, UChicago Department of Astronomy and Astrophysics 2022–Present
- **2025–2026 Brinson Lecturer Selection Committee**, UChicago Astrophysics 2024–2025
- **Chair, SOC, "Picture an Astronomer" (public events/lectures and symposium)** 2024–2025
  pictureanastronomer.github.io – covered by astrobites
- **Congressional Visits Day, American Astronomical Society** 2025
- **Time Domain/Multi-Messenger Astrophysics Sub-Group**, HEX-P proposal team 2022–2024
- **LOC, "Dwarf Galaxies, Star Clusters, and Streams in the LSST Era"** 2024
- **Astronomy & Astrophysics Representative, DSAC**, UChicago Physical Sciences Division 2023–2024
  The PSD Dean's Student Advisory Committee (DSAC) is made up of faculty Deputy Deans, the Dean of Students Office, and a graduate student representative from each department. The DSAC allows graduate students to participate in the Division's administration by offering an advisory voice and liaising between the department and the Division.
- **Graduate Student Liaison, Faculty Search Committee**, UChicago Astrophysics 2023
- **Yale Astronomy Data Science Journal Club Organizing Committee Member** 2021–2022
- **Outreach Subcommittee Chair, Yale Astronomy Climate and Diversity Committee** 2020–2022
- **IDEA Journal Club Organizing Committee Member** 2020–2022
  "Inclusion, Diversity, and Equity in Astronomy" (IDEA) Journal Club, Yale Astronomy
- **Advocacy Chair, Yale Women in Physics+** 2019–2022
- **LOC, CUWiP** 2018–2019
  2019 American Physical Society Conference for Undergraduate Women in Physics hosted at Northwestern University through the Society of Women in Physics & Astronomy and the Department of Physics & Astronomy.
- **Weinberg College of Arts & Sciences Student Advisory Board**, Northwestern University 2018
  Invited by department to serve as Physics & Astronomy representative.

Outreach & Other Pertinent Experience

- **SIRIUS B** (formerly the Lakota Cultural Exchange Program, LCEP) 2009–Present
  Additional details at siriusb.org, thelakotaculturalexchangeprogram.org, and our Facebook page.
  Founded the program in 2009 and have run programming through it consistently since then. What began as a girls-helping-girls self-defense initiative has grown into permanent music programs on the reservation and a continuing STEM outreach effort at Northwestern University. As everything else, a bit derailed by the COVID-19 pandemic, but we are now piloting extended, virtual opportunities for students on the reservation/in rural areas.
- **Astronomy Conversations**, Adler Planetarium 2024–Present
- **Mentor, IAU NA-ROAD Women and Girls in Astronomy Program** 2024
- **Skype-a-Scientist** 2021–2024
- **Organizer, Astronomy on Tap New Haven** 2019–2022
- **Letters to a Pre-Scientist** 2021–2022
- **Peer Orientation Mentor, Yale Graduate School of Arts & Sciences** Fall 2020
  Piloted through the GSAS and Graduate Student Development & Diversity. Welcomed and oriented a group of first year graduate students (from various departments) to Yale and New Haven. Charged with building community despite the pandemic and offering ongoing mentorship and support to ensure new student success in the graduate school.
- **Volunteer, Yale Pathways to Science Telescope Workshops** July 2019
- **Dearborn Observatory Telescope Operator** 2017–2019
  Northwestern University Department of Physics & Astronomy; supervisor: Prof. Michael Smutko. Ran telescope, hosted events, and answered questions pertaining to the field and observatory.

Publications

First author

21. **A. Polzin**, Z. Qu, H.-W. Chen, "The Low-Mass Baryon Cycle in QUEST Dwarf Galaxies: Sample definition and first results", *In preparation for submission to OJAp.*

20. **A. Polzin**, A. V. Kravtsov, V. A. Semenov, and N. Y. Gnedin, "Modeling star formation in low-metallicity galaxies", *In preparation for submission to OJAp.*

19. **A. Polzin**, "`spike`: A tool to drizzle *HST*, *JWST*, and Roman PSFs for improved analyses", JOSS, *submitted.* (arXiv/ADS/GitHub)

18. **A. Polzin**, A. V. Kravtsov, V. A. Semenov, and N. Y. Gnedin, "On the universality of star formation efficiency in galaxies", OJAp, vol. 7, Dec. 2024. (arXiv/ADS)

17. **A. Polzin**, L. Newburgh, P. Natarajan, and H.-W. Chen, "Forecasting galaxy cluster HI mass recovery with CHIME at redshifts $z = 1$ and 2 via the IllustrisTNG simulations", MNRAS, vol. 533, no. 2, p. 1852, Aug. 2024. (arXiv/ADS/GitHub)

16. **A. Polzin**, A. V. Kravtsov, V. A. Semenov, and N. Y. Gnedin, "Modeling molecular hydrogen in low-metallicity galaxies", ApJ, vol. 966, no. 2, p. 172, May 2024. (arXiv/ADS)

15. **A. Polzin**, Y. Asali, S. Bhimani, M. Brady, M. C. Chen, L. DeMarchi, M. Gurevich, E. Lichko, E. Louden, J. Malewicz, S. Pagan, M. Rice, Z. Shen, E. Simon, C. Stauffer, J. L. Zagorac, K. Auchettl, K. Breivik, H.-W. Chen, D. Coppejans, S. Kolwa, R. Margutti, P. Natarajan, E. Nelson, K. L. Page, S. Toonen, K. E. Whitaker, and I. Zhuravleva, "Astronomy as a Field: A Guide for Aspiring Astrophysicists", BAAS, *submitted*, 2023. (arXiv/ADS)
Non-refereed book intended as a primer for students looking to pursue astrophysics professionally.
This work was highlighted by Yale Physics, Wright Lab, and Astronomy (in their News and Newsletter)

14. **A. Polzin**, R. Margutti, D. L. Coppejans, K. Auchettl, K. L. Page, G. Vasilopoulos, J. S. Bright, P. Esposito, P. K. G. William, K. Mukai, and E. Berger, "The phase space of Galactic and extragalactic X-ray transients out to intermediate redshifts", ApJ, vol. 959, no. 2, p. 75, Dec. 2023. (arXiv/ADS)
Dataset and code access here.

13. **A. Polzin**, P. van Dokkum, S. Danieli, J. P. Greco, and A. J. Romanowsky, "A recently quenched isolated dwarf galaxy outside of the Local Group environment", ApJL, vol. 914, no. 1, p. L23, Jun. 2021. (arXiv/ADS)
This work was picked up by astrobites (shared by AAS Nova) and the Yale Scientific Magazine.

Second and third author

12. T. B. Miller, I. Pasha, **A. Polzin**, and P. van Dokkum, "`Silkscreen`: Direct measurements of galaxy distances from survey image cutouts", ApJ, *submitted.* (arXiv/ADS/GitHub)

11. M. Brightman, R. Margutti, **A. Polzin**, A. Jaodand, K. Hotokezaka, J. A. J. Alford, G. Hallinan, E. Kammoun, K. Mooley, M. Masterson, L. Marcotulli, A. Rau, T. Wevers, G. A. Younes, D. Stern, J. A. Garcia, and K. Madsen, "The High Energy X-ray Probe (HEX-P): Sensitive broadband X-ray observations of transient phenomena in the 2030s", Front. Astron. Space Sci., vol. 10, Jan. 2024. (arXiv/ADS)

10. A. M. Geller, **A. Polzin**, A. Bowen, and A. A. Miller, "Simulating eclipsing binary yields of the Rubin Observatory in the Galactic field and star clusters", ApJ, vol. 919, no. 2, p. 83, Sep. 2021. (arXiv/ADS)

Contributing author

9. N. A J, R. Margutti, E. Wiston, R. Chornock, S. Campana, T. Laskar, K. Murase, M. Krips, G. Migliori, D. Tsuna, K. D. Alexander, P. Chandra, M. Bietenholz, E. Berger, R. Chevalier, L. Dessart, R. Dieseing, B. W. Grefenstette, W. V. Jacobson-Galán, K. Maeda, B. Marcote, D. Milisavljevic, A. K. Ray, A. Reguitti, and **A. Polzin**, "Dinosaur in a Haystack: X-ray view of the entrails of SN 2023ixf and the radio afterglow of its interaction with the medium spawned by the progenitor star (Paper I)", ApJ, *submitted*, 2024. (arXiv/ADS)

8. D. Ibrahimzade, R. Margutti, J. S. Bright, P. Blanchard, K. Paterson, D. Lin, H. Sears, **A. Polzin**, I. Andreoni, G. Schroeder, K. D. Alexander, E. Berger, D. L. Coppejans, A. Hajela, J. Irwin, T. Laskar, B. D. Metzger, J. C. Rastinejad, and L. Rhodes, "Constraints on relativistic jets from the Fast X-ray Transient 210423 using prompt radio follow-up observations", ApJ, vol. 980, no. 1, p. 92, Feb. 2025. (arXiv/ADS)

7. The CHIME Collaboration (incl. **A. Polzin**), "Detection of cosmological 21 cm emission with the Canadian Hydrogen Intensity Mapping Experiment", ApJ, vol. 947, no. 1, p. 16, Apr. 2023. (arXiv/ADS)
This work was featured in Scientific American (highlighted by the Wright Lab news).

6. F. Förster, A. M. Muñoz Arancibia, I. Reyes, A. Gagliano, D. J. Britt, S. Cuellar-Carrillo, F. Figueroa-Tapia, **A. Polzin**, Y. Yousef, J. Arredondo, D. Rodríguez-Mancini, J. Correa-Orellana, A. Bayo, F. E. Bauer, M. Catelan, G. Cabrera-Vives, R. Dastidar, P. A. Estévez, G. Pignata, L. Hernandez-Garcia, P. Huijse, E. Reyes, P. Sánchez-Sáez, M. Ramirez, D. Grandón, J. Pineda-García, F. Chabour-Barra, and J. Silva-Farfán, "`DELIGHT`: Deep Learning Identification of Galaxy Hosts of Transients using multi-resolution images", AJ, vol. 164, no. 5, p. 195, Oct. 2022. (arXiv/ADS/GitHub/PyPI)
This paper was picked up by El Mostrador and Nova Ciencia.

5. M. A. Keim, P. van Dokkum, S. Danieli, D. Lokhorst, J. Li, Z. Shen, R. Abraham, S. Chen, C. Gilhuly, Q. Liu, A. Merritt, T. B. Miller, I. Pasha, and **A. Polzin**, "Tidal Distortions in NGC 1052-DF2 and NGC 1052-DF4: Independent evidence for a lack of dark matter", ApJ, vol. 935, no. 2, p. 160, Aug. 2022. (arXiv/ADS)

4. The CHIME Collaboration (incl. **A. Polzin**), "An overview of CHIME, the Canadian Hydrogen Intensity Mapping Experiment", ApJS, vol. 261, no. 2, p. 29, Jul. 2022. (arXiv/ADS)

3. The CHIME Collaboration (incl. **A. Polzin**), "Using the Sun to measure the primary beam response of the Canadian Hydrogen Intensity Mapping Experiment", ApJ, vol. 932, no. 2, p. 100, Jun. 2022. (arXiv/ADS)

2. Q. Liu, R. Abraham, C. Gilhuly, P. van Dokkum, P. G. Martin, J. Li, J. P. Greco, D. Lokhorst, S. Chen, S. Danieli, M. A. Keim, A. Merritt, T. B. Miller, I. Pasha, **A. Polzin**, Z. Shen, and J. Zhang, "A method to characterize the wide-angle point spread function of astronomical images", ApJ, vol. 925, no. 2, p. 219, Feb. 2022. (arXiv/ADS)

1. I. Pasha, D. Lokhorst, P. G. van Dokkum, S. Chen, R. Abraham, J. Greco, S. Danieli, T. Miller, E. Lippitt, **A. Polzin**, Z. Shen, M. A. Keim, Q. Liu, A. Merritt, and J. Zhang, "A nascent tidal dwarf galaxy forming within the northern HI streamer of M82", ApJL, vol. 923, no. 2, p. L21, Dec. 2021. (arXiv/ADS)
This paper was highlighted by Yale News (shared by the Dunlap Institute, Phys.org, EurekAlert!, and ScienceDaily) and SyFy Wire's popular Bad Astronomy.

Seminars & Conference Presentations (⋆ indicates invited)

On science

⋆ "Modeling molecular hydrogen in low metallicity galaxies", seminar at UMT Lahore (virtual); *upcoming*

- "Molecular gas in low metallicity galaxies and its implications for star formation modelling", poster + flash talk at *Small Galaxies, Cosmic Questions – II* (Durham, UK); August 1, 2024.

⋆ "Star formation in low metallicity galaxies", University of Oxford Galaxy Evolution Seminar; July 23, 2024.

- "Molecular gas in low metallicity galaxies and its implications for star formation modelling", talk at NAM 24: *Modelling Astrochemical Processes in the Universe* (Hull, UK); July 17, 2024.

- "Star formation in low-metallicity dwarf galaxies", poster + flash talk at *Dwarf Galaxies, Star Clusters, and Streams in the LSST Era* (Chicago, IL); July 9, 2024.

⋆ "Star formation in low metallicity galaxies", Yale University Galaxy Lunch seminar; May 1, 2024.

- "Molecular gas in low metallicity galaxies and its implications for star formation modeling", talk at the 2024 RAMSES User Meeting (New York, NY); April 24, 2024.

- "Molecular gas in low metallicity galaxies and its implications for star formation", poster + flash talk at the 2024 STScI Spring Symposium: *Recipes to Regulate Star Formation at All Scales: From the Nearby Universe to the First Galaxies*; April 17, 2024. (Video)

⋆ "Star formation in low metallicity galaxies", seminar at Vanderbilt University; March 19, 2024.

- **A. Polzin**, A. V. Kravtsov, V. A. Semenov, N. Y. Gnedin, "Molecular gas in low metallicity galaxies and its implications for star formation". Poster presented at the 243rd American Astronomical Society Meeting; Jan. 10, 2024; New Orleans, LA. (iPoster)
- "Molecular gas in low metallicity galaxies and its implications for star formation", talk at the 2023 Institut d'Astrophysique de Paris conference: *New Simulations for New Challenges in Galaxy Formation*; December 11, 2023.
- "The Phase Space of X-ray Transients Out to z = 1", University of Chicago Department of Astronomy & Astrophysics Astro Tuesday Chalk Talk; March 7, 2023.
- ⋆ "A recently quenched isolated dwarf galaxy outside of the Local Group environment", presentation at the OSU Astro Coffee (given virtually); May 20, 2021.
- "The Phase Space of Galactic and Extragalactic X-ray Transients", MIT Kavli Institute Brown Bag Lunch Talk (given virtually); Oct. 26, 2020.
- **A. Polzin**, A. Geller, A. Miller, K. Breivik, "Exploring the Eclipsing Binary Yield of the Large Synoptic Survey Telescope". Poster presented at the 233rd American Astronomical Society Meeting; Jan. 9, 2019; Seattle, WA. (ADS)
- **A. Polzin**, A. Geller, A. Miller, K. Breivik, "Exploring the Eclipsing Binary Yield of the Large Synoptic Survey Telescope". Poster presented at the Greater Chicago Undergraduate Women in Physics Workshop (The University of Chicago); Sept. 30, 2018; Chicago, IL.
  Received poster award.
- "Examining drone calibrations for HIRAX", Wright Laboratory Undergraduate Research Symposium, Yale University, July 30, 2018
- **A. Polzin**, A. Geller, A. Miller, K. Breivik, "Exploring an Improved Method for Determining LSST's Eclipsing Binary Yield". Poster presented at the Adler Planetarium and Northwestern Department of Physics & Astronomy for the 2017 CIERA REU; Aug. 17 - 18, 2017; Evanston, IL and Chicago, IL.

On outreach and education

- ⋆ "SIRIUS B: Sirius-ly good STEM instruction", *Cosmovisions of the Pacific Phase II*, Kona, HI; Jan. 25-28, 2025.
  NASA/NSF-funded, primarily discussion-based conference focused on building bridges between Western and Indigenous astronomy educators and practitioners.
- ⋆ "Astronomy as a Field: A Guide for Aspiring Astrophysicists", Vanderbilt University Whole Self Science Seminar; March 18, 2024.
- ⋆ "SIRIUS B VERGE", AAS 243 Exhibitor Theater, New Orleans, LA; Jan. 9, 2024.
  Video available here.
- ⋆ "Stellar STEM Weekends", Northwestern University Center for Native American & Indigenous Research Symposium; May 17, 2019.
  Video available on the LCEP webpage (under "STEM Outreach" tab).

Selected Successful Observing Proposals

- **(Submitter/Co-I)** "Star formation in low-mass dwarf galaxies with CGM constraints", Magellan/IMACS — Chicago 2025A
  Graduate students are not able to PI Magellan proposals at UChicago, so "submitter" indicates primary responsibility.
- **(Co-I)** "The star formation-ISM-CGM connection in dwarf galaxies", MMT/Binospec — NU 2025A
  Primarily responsible for proposal.
- **(Submitter/Co-I)** "Completing a Southern sky sub-sample of representative dwarf galaxies as a test of the baryon cycle", Magellan/IMACS — Chicago 2024A
- **(Submitter/Co-I)** "Elucidating galaxy quenching in low-mass dwarfs", Magellan/IMACS — Chicago 2023A
- **(Co-I)** "A galaxy apparently formed by star formation in massive, extremely dense clumps of gas", Keck/LRIS + KCWI — Yale 2022A
- **(Co-I)** "Radial velocities of low mass galaxies from broad slit spectroscopy with LRIS", Keck/LRIS — Yale 2021B
- **(Co-I)** "A nearby globular cluster-rich ultra diffuse galaxy", Keck/LRIS + KCWI — Yale 2020A

Selected Grant Funding (fellowships/scholarships listed under Honors & Awards)

- "Increasing Representation for, and Retention of, Women in Astrophysics", 2024
  University of Chicago Women's Board Grant ($15,000)
- **(PI)** "Elucidating galaxy quenching with absorption probes of halos around low-mass dwarfs", Cycle 30
  HST AR-17049 ($142,058; MAST/ADS)
- Center for Native American & Indigenous Research Event Co-Sponsorhip Grant Spring/Summer 2019
  Northwestern University; award in the amount of $1000, which facilitated the Lakota Stellar STEM Weekend for middle school-age girls from Pine Ridge Reservation.
- Office of Institutional Diversity & Inclusion Event Sponsorship Grant Spring/Summer 2018 & 2019
  Northwestern University; two awards, each in the amount of $2500, which were sufficient to cover all expenses (travel, food, housing, program costs, incidentals) for Stellar STEM Weekend for middle school girls from the Bad River Ojibwe band and partially funded another Stellar STEM Weekend for half a dozen Lakota girls from Pine Ridge Reservation.
- "Optimizations on the HIRAX radio array", Weinberg College of Arts & Sciences Research Grant Summer 2018
  Award in the amount of $3500 to facilitate summer research completed in the Yale University Department of Physics
- Northwestern Summer Internship Grant Program awarded for Summer 2018
  Award in the amount of $3000 to facilitate summer research, turned down in favor of WCAS Research Grant.
- "9/11 and the Troubles – Representations, Ramifications, Responses, and Realities", 2015
  USC Dornsife Summer Undergraduate Research Fund
  Award in the amount of $3000 to fund summer research. Project in conjunction with the Thematic Option Interdisciplinary Humanities Honors Program and Fulbright Summer Institute.
- HERLead (formerly ANNpower)/Vital Voices Grant (Chicago Sun-Times) 2014 & 2015
  Received for independently established Lakota Cultural Exchange Program. Two awards in the amount of $2500 each to support exchange and enrichment efforts for girls on Pine Ridge Reservation, South Dakota.

Honors & Awards (⋆ indicates major national/international award)

⋆ **K. Patricia Cross Future Leaders Award**, American Association of Colleges & Universities 2025
"Recognizes graduate students who show exemplary promise as future leaders of higher education."

⋆ **Quad Fellowship** ($40,000; UChicago PSD News) 2024–2025
"Elevating the brightest minds in STEM for collective good." Administered by IIE.

- **Audience Choice Award**, UChicago Three Minute Thesis (3MT) Competition (Video/Slide) 2024
- **WGAP Fellowship**, IAU North American Regional Office of Astronomy for Development 2023
  Women and Girls in Astronomy Program Fellowship and $1000 mini-grant for development of VERGE (Virtual Events for Remote Gathering and Engagement) outreach programming. Administered by the International Astronomical Union.

⋆ **Honorable Mention, NAS Ford Foundation Predoctoral Fellowship** 2022 & 2023
Alternate for 2023 award.

- **NASA Illinois Space Grant Consortium Graduate Fellowship** 2022–2023
  Award in the amount of $10,000 to facilitate research in the space sciences.
- **Dean's Emerging Scholars Fellowship**, Yale University 2019–2022
  Awarded annually to 15 incoming Yale PhD students who "exhibit outstanding academic promise and achievement" and have worked on/promoted diversity-related initiatives or are traditionally underrepresented in their field.

⋆ **Honorable Mention, NSF Graduate Research Fellowship Program** 2019 & 2021

- **NASA Illinois Space Grant Consortium Undergraduate Fellowship** 2017–2018
  Award in the amount of $3000 to facilitate academic year research in the space sciences.

⋆ **DAAD Research Internship in Science and Engineering** awarded for Summer 2017
Declined in order to participate in 2017 Northwestern CIERA REU cohort.

⋆ **Bruce Fishkin Scholarship Fund** (Chicago Tribune) 2014–2018
Full scholarship (including tuition, housing, books, food, and incidental costs) for four years of university education. Applied funding at both the University of Southern California and Northwestern University.

- **USC Deans and University Scholarships** 2014–2016
Quarter tuition (and additional several thousand dollar supplement) merit-based scholarship attendant to admission to the University of Southern Californa and its Resident Honors Program.
- **USC Academic Achievement Award** Spring and Fall 2015

⋆ **Fulbright Summer Institute** (USC Dornsife News) 2015
- Via the US-UK Fulbright Commission. Opportunity to spend a portion of the summer at Queen's University Belfast learning about conflict resolution and cultural history in a region famous for its profound turmoil and, subsequently, remarkable initiatives to mitigate sectarianism and heal a population traumatized by the Troubles.
- Served as reviewer for 2019 Summer Institute applications.

⋆ **HERLead Leadership Forum Fellow** 2014

- **USC Thematic Option Honors Program** admitted 2014
Interdisciplinary humanities honors program, undertaken in lieu of usual general education requirements.
- **USC Resident Honors Program** admitted 2014
Invited to apply for, and admitted to, the RHP at USC, which enabled exceptional students to begin their freshman year of college at USC in Los Angeles in lieu of their senior year of high school.

Memberships & Activities

- **LSST Galaxies Science Collaboration** 2024–Present
- **Roman WFI Working Groups** 2024–Present
Roman External Synergies and Roman Space Telescope Simulations working groups.
- **Community Engagement Working Group**, UChicago Astronomy & Astrophysics 2022–Present
- **Dragonfly Telephoto Array Collaboration** 2020–Present
- **American Physical Society** 2018–Present
- **American Astronomical Society** 2017–Present
- **HEX-P proposal team** 2022–2024
- **Canadian Hydrogen Intensity Mapping Experiment (CHIME) Collaboration** 2020–2022
- **Astronomy Climate and Diversity Committee**, Yale University 2020–2022
Outreach subcommittee lead and Equity & Diversity Journal Club planning committee member.
- **Women in Physics+**, Yale University 2019–2022
Served as advocacy chair from October 2019.
- **Sigma Xi (ΣΞ)**, Associate Member inducted 2019
National scientific research honors society.
- **Sigma Pi Sigma (ΣΠΣ)**, Northwestern University inducted 2018
National physics honors society.
- **Weinberg College Student Advisory Board**, Northwestern University Fall 2018
Selected by department as Physics & Astronomy representative.
- **Society of Physics Students**, Northwestern University 2016–2019
- Elected President for 2017-2018 year; assumed duties April 2017
- Initiatives include establishing fundraising effort in conjunction with Dearborn Observatory (selling observatory-branded gear to fund outreach), renovating office and repurposing the space to help it serve as an undergraduate major lounge, planning monthly undergraduate events for prospective and current majors and minors, and working to enhance involvement with department.
- **Society of Women in Physics and Astronomy**, Northwestern University 2016–2019
- **Sigma Gamma Epsilon (ΣΓE)**, University of Southern California inducted 2015
National earth sciences honors society.

Observing & Computing Experience

- **Dragonfly Telephoto Array** (52 nights)
- **Keck/LRIS** (2 nights)
- **Keck/NIRES** (2 nights)
- **Magellan/IMACS** (4 nights)
- **Magellan/LDSS3** (1 night)
- **Palomar/TripleSpec** (2 nights)
- **Midway High Performance Computing Cluster**, The University of Chicago 2022–Present
- **Cedar High Performance Computing Cluster**, Compute Canada 2020–2022
- **Quest High Performance Computing Cluster**, Northwestern University 2017–2019

Popular Science Communication Experience (outside of outreach and teaching)

- **Featured Guest, astrO Podcast** forthcoming
- **Featured Guest, AstroArticulated Podcast** (Episode) Oct. 2024
- **Kavli SciComm Essentials Certificate**, The Kavli Foundation Dec. 2023
- **Certificate in Science Communication**, Northwestern University/CIERA June 2022

Open-Source Software Development

Lead/Sole Developer i.e., I was entirely responsible for the idea of the software and its codebase

- `albumpl`
  Custom perceptually uniform, color blind-friendly `matplotlib` *color palettes based on album covers.*
- `angelus`
  Cross-match a field or survey with galaxy and quasar catalogs and infer virial coverage.
- `cutout`
  Astronomical survey cutouts plotted directly with minimal user input.
- `gaiacmds`
  Gaia color-magnitude diagrams from simple object/coordinate searches.
- `rahrah`
  University-inspired `matplotlib` color palettes and colormaps.
- `spike` (Polzin 2025)
  All-in-one tool to generate, and correctly drizzle/resample, HST, JWST, and Roman point spread functions.
- `xraydlps` (Polzin et al. 2023)
  Tools to classify and plot X-ray transients from light curves and light curve summary statistics.

Co-Developer i.e., I contributed to the conception/implementation of the software and its codebase

- `DELIGHT` (Förster et al. 2022)
  Deep Learning Identification of Galaxy Hosts of Transients using multi-resolution images.
- `silkscreen` (Miller et al. 2024)
  Galaxy distances and properties from survey imaging via simulation-based inference.

Contributor i.e., I worked on a very specific part of the software's codebase (noted below)

- `CCLya-Payne` (Solhaug et al. 2024)
  Neural network to emulate Lyα emission profiles from radiative transfer simulations.
  I streamlined/simplified the code and made it installable as a package.