

Ethan Silver

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EDUCATION

HARVARD UNIVERSITY

Ph.D. in Physics (in progress)

M.A. Physics (Feb 2026)

Advisor: Edo Berger

Cambridge, MA

August 2023 - present

UNIVERSITY OF CALIFORNIA BERKELEY

B.A. Physics, B.A. Astrophysics, B.A. Data Science; GPA: 4.0/4.0 (Highest Distinction)

Berkeley, CA

August 2023

RESEARCH INTERESTS

Supernova precursor emission; core collapse supernovae; final stages of massive star evolution; mass loss in massive stars; gravitational-wave astronomy; black holes, AGNs, and TDEs; ML in astrophysics; strong lensing.

MOST RECENT RESEARCH EXPERIENCE

CENTER FOR ASTROPHYSICS | HARVARD & SMITHSONIAN, BERGER TIME-DOMAIN GROUP, March 2024-present

Graduate Student Researcher advised by Edo Berger

- Identify and characterize supernova precursor emission using time-domain surveys such as ZTF and LSST.
- Trained convolutional neural networks to detect gravitational wave signals from binary black hole mergers in LIGO's O1-O3 observing runs (project for PhD candidacy).

LAWRENCE BERKELEY NATIONAL LAB, PHYSICS DIVISION, STRONG LENSING GROUP, January 2022 – present

Undergraduate Research Apprentice advised by Xiaosheng Huang, and in collaboration with Adam Bolton. The Strong Lensing Group, a subgroup of The Supernova Cosmology Project (Lead PI: Saul Perlmutter), searches for new strong gravitational lenses and strongly lensed supernovae using machine learning techniques.

- Trained neural networks on simulated images of galaxies strongly-lensed by galactic-scale to subgalactic-scale halos to find conventional-sized to very low halo mass strong lenses in real HST and JWST observations.
- Contributed to the analysis of a strongly lensed multiply-imaged Type Ia supernova (SN Zwicky).

SLAC NATIONAL ACCELERATOR LABORATORY, ASTROPHYSICS DIVISION, June 2021 – January 2024

DOE Science Undergraduate Laboratory Intern (SULI program) under the direction of Elena Orlando

- Completed two SULI internships fitting and optimizing models of galactic cosmic ray (CR) propagation to the most recent data from Voyager 1 and AMS-02 using the optimization library Minuit2 and GALPROP code.

FIRST AUTHOR PUBLICATIONS

- **E. Silver**, P. Krastev, E. Berger, 2025, "A Search for Binary Black Hole Mergers in LIGO O1-O3 Data with Convolutional Neural Networks", submitted to Phys. Rev. D. [[arXiv:2512.17204v1](https://arxiv.org/abs/2512.17204v1)]
- **E. Silver**, R. Wang, X. Huang, A. Bolton, C. Storfer, S. Banka, 2025, "ML-Driven Strong Lens Discoveries: Down to $\theta_E \sim 0.03''$ and $M_{\text{halo}} < 10^{11} M_{\odot}$ ", [ApJ](https://doi.org/10.1086/apj.2025.994.1), 994 (1), 117. [[arXiv:2507.01943](https://arxiv.org/abs/2507.01943)].
- **E. Silver**, E. Orlando, 2024, "Testing Cosmic-Ray Propagation Scenarios with AMS-02 and Voyager Data", [ApJ](https://doi.org/10.1086/apj.2024.963.2), 963 (2), 111. [[arXiv:2401.06242](https://arxiv.org/abs/2401.06242)].

CONTRIBUTING AUTHOR PUBLICATIONS

- F. Urcelay, X. Huang et al. (*incl.* E. Silver), 2026, "The Carousel Lens II: Cosmological Constraints with GIGA-Lens". [[arXiv:2602.16077v1](https://arxiv.org/abs/2602.16077v1)].
- X. Huang et al. (*incl.* E. Silver), 2026, "DESI Strong Lens Foundry I: HST Observations and Modeling with GIGA-Lens", [ApJ](https://doi.org/10.1086/apj.2026.998.1), 998 (1), 69. [[arXiv:2502.03455](https://arxiv.org/abs/2502.03455)].
- X. Huang et al. (*incl.* E. Silver), 2025, "DESI Strong Lens Foundry V: A Sample of HST-Observed Strong Lenses Modeled with GIGA-Lens". [[arXiv:2512.07823v2](https://arxiv.org/abs/2512.07823v2)].

- X. Huang et al. (*incl.* E. Silver), 2025, “DESI Strong Lens Foundry II: DESI Spectroscopy for Strong Lens Candidates”, [[arXiv:2509.18089](https://arxiv.org/abs/2509.18089)].
- J.D.R. Pierel et al. (*incl.* E. Silver), 2023, “LensWatch: I. Resolved HST Observations and Constraints on the Strongly-Lensed Type Ia Supernova 2022qmx (“SN Zwicky”)”, [ApJ, 948 \(2\), 115](#). [[arXiv:2211.03772](https://arxiv.org/abs/2211.03772)].

CONFERENCES

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|---|------------|
| 27 th European Cosmic Ray Symposium | July, 2022 |
| ▪ Talk: Comparing Propagation Models with Local Cosmic Ray Spectra | |
| 240th meeting of the AAS | June, 2022 |
| ▪ iPoster: Comparing Propagation Models with Local Cosmic Ray Spectra | |

TEACHING

HARVARD UNIVERSITY

- Teaching Fellow for *Physical Science 12A: Mechanics from an Analytic, Numerical, and Experimental Perspective* – Spring 2025
- Teaching Fellow for *Physical Science 12B: Electromagnetism from an Analytic, Numerical, and Experimental Perspective* – Fall 2024

AWARDS/HONORS

- Phi Beta Kappa Member (Summer 2023)
- Graduated with Highest Distinction from UC Berkeley (Summer 2023)
- Edward Frank Kraft Award for Freshmen at UC Berkeley (Fall 2019)
- National Merit Scholarship (Spring 2019)

TECHNICAL SKILLS

- Python (Libraries: Matplotlib, NumPy, Pandas, SciPy, Iminuit), SQL, LabVIEW, MATLAB, C, C++, Java, LaTeX
- Machine Learning/Neural Networks/Deep Learning: TensorFlow, Keras, PyTorch