



Eliza Diggins

ASTROPHYSICIST / MATHEMATICIAN

PROFESSIONAL SUMMARY

I'm a theoretical astrophysicist and mathematician working on my Ph.D at the University of California Berkeley. My research interests broadly concern the dynamics of astrophysical systems and what they can tell us about fundamental physics. I use a mix of computational, analytic, and observational techniques to study these questions.

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 eliza-diggins.github.io

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 github.com/Eliza-Diggins

EDUCATION

Doctor of Philosophy in Astrophysics

University of California, Berkeley – Berkeley, California

2025-2030

- GPA: 0.0

Honors Bachelor of Science (HBS) in Physics

University of Utah – Salt Lake City, Utah

2020-2024

- GPA: 4.0 – (*Suma Cum Laude*)
- Thesis: Constraining Modified Gravity Using Galaxy Clusters. Advisor: Dr. Daniel R. Wik

Bachelor of Science (BS) in Applied Mathematics

University of Utah – Salt Lake City, Utah

2020-2024

- GPA: 4.0 – (*Suma Cum Laude*)

International Baccalaureate Diploma

Hillcrest High School – Midvale, Utah

2016-2020

- GPA: 4.0

RESEARCH POSITIONS

Research Scientist | April 2022 - Current

(April 2023 - April 2024 as a **Parmley Scholar**)

University of Utah Department of Physics and Astronomy

Worked as part of the X-ray astronomy group with Dr. Daniel R. Wik studying dynamical processes in galaxy clusters and their connection to fundamental physics and cosmology.

- Performed hydrodynamics + N-body simulations of galaxy cluster mergers in non-Newtonian gravity. Co-developer of the cluster generator software.
- Initiated development of the Pisces library for astrophysical model generation and its corresponding geometry engine PyMetric.
- Studied dynamics of galaxy clusters in best-of-class cosmological simulations like TNG-300 and TNG-Cluster to constrain observations with the XRISM Observatory.

Lab Technician | March 2022 - February 2025

(August 2022 - May 2023 as a **UROP Scholar**)

(May 2023 - May 2024 as a **Wilkes Climate Scholar**)

(May 2024 - February 2025 as the Lead Data Scientist)

University of Utah School of Dentistry – Weller Lab

Worked in the Weller Lab under Dr. Melodie L. Weller on mathematical modeling of epidemiological phenomena and big-data studies of rare disease epidemiology.

- Developed novel algorithms and mathematical methods for tracking and identification of trade mediated pathogens.
- Utilized machine learning and big-data methodologies to probe connections between rare disease and autoimmune conditions.
- Identified novel spikes in Hepatitis Delta prevalence using big-data surveys.
- Led the development and growth of a multidisciplinary data science team focused on the long-term integration of computational research.

Undergraduate Researcher | January 2021 - January 2022

University of Utah Department of Mathematics

Worked under Dr. Fred Adler to model SARS-COV-2 virion deposition in the human respiratory system.

- Modeled the transport of COVID-19 virions in the human respiratory system using computational models.
- Developed simplified models of human lungs for fluid dynamics computations.

TEACHING POSITIONS

ASTRON 7a: Introduction to Astrophysics - GSI - Fall 2025

University of California, Berkeley

SIGNIFICANT AWARDS / RECOGNITIONS

2026 Chancellor's Fellowship for Graduate Study (\$18,000)

- Awarded to top admitted graduate students at UC Berkeley.

2025 Churchill Scholarship Alternate

- The Churchill scholarship is awarded annually to 16 outstanding scholars in the sciences. 4 Alternates are named. Winners are funded for 1 year of postgraduate study at Cambridge.

2024 Alison Regan Library Thesis Award (\$1,000)

- Awarded annually by the Marriot Library at the University of Utah to the best honors theses in science and in the humanities. Awarded for *Constraining Modified Gravity Using Galaxy Clusters*.

2024 Outstanding Senior Award (\$1,000)

- Awarded by the University of Utah Department of Physics and Astronomy to an outstanding graduating senior.

2024 Gibson Senior Award (\$1,000)

- Awarded by the University of Utah Department of Mathematics to the student with the highest graduating GPA.

2024 Rhodes Scholarship Finalist

- Awarded by the Rhodes Trust – District 13 for the honor of being named as a finalist for the Rhodes Scholarship.

2023 APS 4 Corners Speaker Award

- Awarded by the 4 Corners section of the American Physical Society for an outstanding oral presentation at the 2023 APS 4C conference.

2023 Goldwater Scholarship (\$7,500)

- Awarded by the Barry Goldwater Scholarship and Excellence in Education Foundation for outstanding career and research potential in physics.

2023 Thomas J. Parmley Scholarship (\$10,000)

- Awarded once annually by the University of Utah Department of Physics and Astronomy for outstanding undergraduate research.

2023 Continuing Undergraduate Award (\$1,000)

- Awarded by the University of Utah Department of Physics and Astronomy for outstanding performance in the classroom and in research.

2023 Undergraduate Researcher of the Year

- Awarded by the Office of Undergraduate Research at the University of Utah for work on the mathematical modeling of trade mediated pathogens.

2023 Wilkes Scholar (~\$15,000)

- Awarded by the Wilkes Climate Center at the University of Utah to fund work on the climate impacts on trade mediated pathogens.

July 2021 Ltd. Governor's Award for Outstanding Community Service

- Awarded for 2+ years of service at Guadalupe Schools teaching English as a second language

SERVICE, COMMUNITY, AND ADVOCACY

Program Coordinator | January 2025 - July 2025

(May 2024 - January 2025 as Processes Intern)

(March 2023 - Present as Transgender Friendship Circle Facilitator)

[Encircle SLC](#) – Salt Lake City, Utah

- Responsible for program logistics, volunteer training, quality auditing, community outreach and other aspects of daily operations.
- Responsible for home safety, staff coordination, and guest management; including working with youth and young adults to provide safety and community.
- Developed programming and accommodations for neurodivergent guests.
- Provided community resources including crisis intervention, suicide evaluation, safety planning, and resource distribution for queer youth and young adults.
- Ran the transgender friendship circle, a peer support group from transgender adults. Additionally performed best-practices research and developed programming to optimize the group for its target demographic.

Staff Advisor for LGBTQ Social Club | August 2024 - May 2025

[University of Utah](#) – Salt Lake City, Utah

- Acted as an advisor to University of Utah students seeking to fill gaps in community support infrastructure following the closure of the LGBTQ resource center.
- Provided LGBTQ students with peer-support resources and community space through shared activities.

Student Lecture Series Chair | January 2024 - May 2024

[University of Utah Department of Physics and Astronomy](#)

- Coordinated student lectures in the department to improve student communication skills and pedagogical engagement.
- Strengthen departmental community and our shared love for physics by encouraging innovative, engaging, and entertaining lectures on subjects which are not traditionally seen in an undergraduate degree program.

English as a Second Language Tutor | July 2019 - May 2023

[Guadalupe Schools](#) – Salt Lake City, Utah

- Taught ESL in a small group tutoring environment under the supervision of an ESL specialist.
- Incorporated multifaceted pedagogical strategies into instruction.
- Focused on use-centric teaching to help clients reach language goals as quickly as possible.

WORKSHOPS & PROFESSIONAL DEVELOPMENT

Michigan Cosmology Summer School | June 2025

[University of Michigan](#), Ann Arbor

Participated in advanced lectures and workshops on theoretical and applied cosmology including cosmic inflation, structure formation, dark energy, and LSS.

SELECTED PUBLICATIONS

ASTROPHYSICS

Diggins, E. C., & Wik, D. R. (2025). *Galaxy Cluster Constraints on Extensions of Modified Gravity*. *The Astrophysical Journal*, 989(1), 17.

EPIDEMIOLOGY / MEDICAL SCIENCE

Diggins, E. C., & Weller, M. L. (2025). *Age-Dependent Sex Disparities in Sjogren's Disease Prevalence Align with Natural Hormone Fluctuations*. medRxiv, 2025-02.

Diggins, E. C., & Weller, M. L. (2025). *Unraveling the Impact of COVID-19 on Sjogren's Disease: A Retrospective Cohort Analysis*. (Manuscript undergoing internal review)

SCIENTIFIC SOFTWARE