

# CLAIRE E. WILLIAMS

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## EDUCATION

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**Ph.D., Astronomy and Astrophysics**, University of California, Los Angeles 2023-Present  
Advisor: Smadar Naoz

**M.S., Astronomy and Astrophysics**, University of California, Los Angeles 2021-2023  
Advisor: Smadar Naoz

**B.A., Physics**, Carleton College. Minor in Russian. 2017-2021  
Graduated Magna Cum Laude with Distinction in Physics.  
Senior Integrative Exercise: *Cosmology of the long-term future of the universe.*  
Advisors: Cindy Blaha, Valerie Fox

## RESEARCH APPOINTMENTS

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**Graduate Student Researcher/ NSF Graduate Research Fellow** Sept 2021-present  
UCLA Dept. of Physics and Astronomy *Los Angeles, CA*  
Advisor: Smadar Naoz

- Numerical and analytical studies of low mass structure formation in the presence of a supersonic stream velocity in the early universe

**Competitive Edge Summer Fellow** Aug. 2021 - Sept. 2021  
UCLA Graduate Division *Los Angeles, CA*  
Advisor: Smadar Naoz

**Undergraduate Research Fellow** June 2020-Dec. 2020  
LIGO Laboratory, Massachusetts Institute of Technology (*remote*) *Cambridge, MA*  
Advisor: Salvatore Vitale

- Searching for bias in matched-filter searches for compact binary coalescences at LIGO.

**Undergraduate Research Assistant** Sept. 2019-June 2021  
Carleton College *Northfield, MN*  
Advisor: Jay Tasson

- Constraints on Lorentz violation and birefringence in gravitational wave signals.
- Developing the exact metric for a uniformly moving black hole.

## RESEARCH PUBLICATIONS

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**C. E. Williams**, W. Lake, S. Naoz, B. Burkhart, T. Treu, F. Marinacci, Y. Nakazato, M. Vogelsberger, N. Yoshida, G. Chiaki, Y. S. Chiou, A. Chen *The Supersonic Project: Lighting up the faint end of the JWST UV Luminosity Function*. ApJL **960:L16** (9pp) (2024) [arXiv:2310.03799](https://arxiv.org/abs/2310.03799)

**C. E. Williams**, S. Naoz, W. Lake, Y.S. Chiou, B. Burkhart, M. Vogelsberger, G. Chiaki, F. Marinacci, Y. Nakazato, N. Yoshida, *The Supersonic Project: Morphological and rotational properties of SIGOs and DM GHOSTs*. ApJ **945** 6 (2023) [arXiv:2211.02066](https://arxiv.org/abs/2211.02066)

W. Lake, S. Naoz, F. Marinacci, B. Burkhart, M. Vogelsberger, **C. E. Williams**, Y. S. Chiou, G. Chiaki, Y. Nakazato, N. Yoshida *The Supersonic Project: Star Formation in Early Star Clusters without Dark Matter*. ApJL **956:L7** 1 (8pp) (2023). [arXiv:2306.01047](https://arxiv.org/abs/2306.01047)

W. Lake, S. Naoz, B. Burkhart, M. Vogelsberger, G. Chiaki, F. Marinacci, Y.S. Chiou, N. Yoshida, Y. Nakazato, **C. E. Williams** *The Supersonic Project: The early evolutionary path of SIGOs*. ApJ **943** 132 (2023). [arXiv:2208.05987](https://arxiv.org/abs/2208.05987)

X. Liu, V. F. He, T. M. Mikulski, D. Palenova, **C. E. Williams** et. al. *Measuring the Speed of Gravitational Waves from the First and Second Observing Run of Advanced LIGO and Advanced Virgo*. Phys. Rev. D **102**, 024028 (2020). [arXiv:2005.03121](https://arxiv.org/abs/2005.03121)

## RESEARCH AND CONFERENCE PRESENTATIONS

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<b>Carnegie Observatories Lunch Seminar</b> “Hunting for the earliest and faintest Lambda-CDM galaxies with JWST” ( <a href="#">Link</a> ) Talk presentation.	January 2024 <i>Pasadena, CA</i>
<b>ELTs in Light of JWST</b> “Lighting up faint galaxies at high $z$ through the stream velocity” Talk presentation.	December 2023 <i>Los Angeles, CA</i>
<b>GalFRESCA 2023</b> “Lighting up early galaxies with the stream velocity” Talk presentation.	September 2023 <i>Riverside, CA</i>
<b>2023 Sierra Conference</b> “Lighting up early galaxies with the stream velocity” Poster presentation.	August 2023 <i>Yosemite, CA</i>
<b>JWST Turns One: The birth and growth of galaxies</b> “JWST faint galaxies with the stream velocity” Talk presentation.	July 2023 <i>Sesto, Italy</i>
<b>Dark Matter 2023</b> “Investigating high-redshift progenitors of anomalous dwarf galaxies” Talk presentation.	March 2023 <i>Los Angeles, CA</i>
<b>Supersonic Project Conference 2023</b> “Forming anomalous dwarf galaxies at high redshift” Talk presentation.	March 2023 <i>Los Angeles, CA</i>
<b>Princeton University Galread</b> “Supersonically-induced morphological and rotational properties of SIGOs and DM GHOSs” Paper presentation ( <i>virtual</i> ).	February 2023 <i>Princeton, NJ</i>
<b>GalFRESCA 2022</b> “Supersonically-induced morphological and rotational properties of SIGOs and DM GHOSs” Talk presentation.	Sept 2022 <i>Pasadena, CA</i>
<b>MIT LIGO Laboratory Data Analysis Working Group</b> “Can we detect signals with large violations of GR using PyCBC?” Talk presentation ( <i>virtual</i> ).	Sept 2020 <i>Cambridge, MA</i>
<b>Carleton College Undergraduate Research Symposium</b> “Can LIGO detect signals with large violations of general relativity?” Poster presentation ( <i>virtual</i> ).	Oct 2020 <i>Northfield, MN</i>
<b>Carleton College Undergraduate Research Symposium</b> “Tests of lorentz symmetry with speed of gravity measurements” Poster presentation ( <i>virtual</i> ) with V. He.	Oct 2020 <i>Northfield, MN</i>
<b>Tasson LIGO Research Group</b> “Sky localization and constraints of lorentz violation in the standard model extension” Talk presentation ( <i>virtual</i> ).	Apr. 2020 <i>Northfield, MN</i>

## FELLOWSHIPS AND AWARDS

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<b>NSF Graduate Research Fellowship</b>	2023
<b>UCLA Physics and Astronomy Teaching Award</b>	2023
<b>Competitive Edge Fellowship</b>	2021
<b>Phi Beta Kappa, Carleton College</b>	2021

<b>Kolenkow-Reitz Fellowship for Undergraduate Research</b>	2020
<b>Dean's List, Carleton College</b>	2019
<b>Carleton College Distinguished Scholar Award</b>	2018, 2019, 2020
<b>Philip R. Dunton Scholarship</b>	2019,2020

## TEACHING

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**Instructor and Founder** Jan. 2024-present  
 UCLA Astronomy Introductory Coding Workshop *Los Angeles, CA*

- Workshop to prepare undergraduate students for research experiences in astronomy through fundamental python and astornomy coding skills

**Graduate Teaching Assistant** Sept. 2021-June 2022  
 UCLA Dept. of Physics and Astronomy *Los Angeles, CA*

Courses:

- ASTR 5: Life in the Universe, PHYS 5B Lab: Thermodynamics, Fluids, Waves, Light, and Optics, ASTR 3: Nature of the Universe

**Astronomy Lab Assistant, Grader** Sept. 2020-June 2021  
 Goodsell Observatory, Carleton College *Northfield, MN*

Courses:

- Observational Astronomy, Introduction to Astronomy.

**Problem Solving Facilitator** Sept. 2019-June 2021  
 Carleton College *Northfield, MN*

Courses:

- Introductory courses (Physics 131, 141, 142, 143, 145, 151, and 152), Analytical and Computational Mechanics, Atomic and Nuclear Physics, Quantum Mechanics.

**Physics Lab Assistant, Grader** Jan. 2019-Nov. 2020  
 Carleton College *Northfield, MN*

Courses:

- Introductory courses (Physics 131, 141, 142, 143, 145, 151, and 152), Atomic and Nuclear Physics.

## SERVICE AND OUTREACH

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**Diversity, Equity and Inclusion (DEI) Committee Member** Oct. 2023 - present  
 UCLA Department of Physics and Astronomy *Los Angeles, CA*

**Planetarium Coordinator** June 2022 - present  
 UCLA Planetarium *Los Angeles, CA*

**Graduate Peer Mentor** Oct. 2021-present  
 UCLA Marginalized Identities in Physics and Astronomy *Los Angeles, CA*

**Astronomy Outreach Volunteer** Oct. 2019-June 2021  
 Goodsell Observatory Public Open House *Northfield, MN*

**Undergraduate Women Peer Mentor** Oct. 2020-June 2021  
 Carleton Physicists of Underrepresented Genders *Northfield, MN*

## MENTORSHIP

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### Research Mentees:

Lauren Harvey (*Undergrad @ UCLA*). Project: Star clusters in REBOUND with NFW dark matter profiles.

Avi Chen (*Grad @ Rutgers University*). Project: Turbulent statistics of high- $z$  supersonically induced objects.

### Undergraduate Career Mentees:

Ella Friess (*UCLA*)

Malena Bloom (*UCLA*)

Michaelia Fang (*now a grad student at UC Irvine*)

Deniz Akin (*UCLA*)

## OUTREACH TALKS

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### UCLA Planetarium Shows:

*Los Angeles, CA*

- “What is the Universe made of?” January 2024
- “Butterfly Nebula: a joint poetry reading and planetarium show” with Laura Hogan October 2023
- “Discovering the first galaxies in the universe with Webb” September 2023
- “The James Webb Space Telescope’s First Year of Observations” Mar. 2023
- “Webb’s First Look at the Universe” (Show for *Title I Careers in STEM Day* at UCLA) Oct. 2022
- “Celebrating Hispanic Heritage Month: The James Webb Space Telescope” (Spanish/English Presentation) with Lizvette Villafaña Sept. 2022
- “Black Holes” June 2022
- “The Big Bang: A Timeline of the Early Universe” with Sahil Hegde May 2022
- “Celebrating Women’s History Month: Women Astronomers and their Discoveries” with Nancy Ning March 2022

### UCLA ArtSci Summer Institute

*Los Angeles, CA*

“Webb’s first year of science”

June 2023

### Santa Barbara Astronomical Unit

*Santa Barbara, CA*

“Recent Supersonic Progress in the Formation of the First Structures in the Universe”

Aug. 2022

## ORGANIZATIONS AND COLLABORATIONS

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### The Supersonic Project Collaboration

*Member 2021-present*

### American Association for the Advancement of Science

*Member 2020-present*

### American Physical Society

*Member 2019-present*

### UCLA Marginalized Identities in Physics and Astronomy

*Member 2021-present*

### LIGO (Laser Interferometer Gravitational-wave Observatory) Scientific Collaboration

*Member 2019-2021*