

Megan Barry

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Education

Ph.D. Candidate, Physics, University of California - Davis (UCD), fifth-year graduate student

- Research Advisor: Dr. Andrew Wetzel

Physics, M. S. with Honors, California State University - Long Beach (CSULB) 2020

- Computational Physics track
- Thesis Title: “Identifying the Quark-Hadron Phase Transition in Neutron Stars with g -modes”
- Research Advisor: Dr. Prashanth Jaikumar

Physics, B. S., University of California - Santa Barbara (UCSB) 2013

Publications

Effect of gas accretion on α -element bimodality in Milky Way-mass galaxies in the FIRE-2 simulations

- Parul, H.; Bailin, J.; Loebman, S.; Wetzel, A.; **Barry, M.**; Bhattarai, B. Jan 23, **2025**. MNRAS 537 2

LMC-driven anisotropic boosts in stream–subhalo interactions

- Arora, A.; Garavito-Camargo, N.; Sanderson, R.; Cunningham, E.; Wetzel, A.; Panithanpaisal, N.; **Barry, M.** Oct 17, **2024**. ApJ 974 286

The dark side of FIRE: predicting the population of dark matter subhaloes around Milky Way-mass galaxies

- **Barry M.**, Wetzel A., Chapman S., Samuel J., Sanderson R., Arora A. May 12, **2023**. MNRAS 523 1

Lifting the Veil on Quark Matter in Compact Stars with g -mode Oscillations

- Wei W., Salinas M., Klähn T., Jaikumar P, **Barry M.** Dec 3, **2020**. ApJ 904 187

Skills & Abilities

Physics Research Experience

- Galaxy simulations: working with & analyzing data from the FIRE (Feedback In Realistic Environments) simulations of Milky Way-mass galaxies
- Stellar structure: building stellar models, working with equations of state, stellar pulsations, compact objects
- Quantum statistics: Fermi-Dirac statistics, extreme astrophysical environments
- Quantum phase transitions: Ising model, Heisenberg model

Coding & Computational Methods

- Proficient Languages: Python, C, Fortran, Mathematica, G (LabVIEW), IDL
- Experience with numerical integration, large matrix manipulation, working with large data files, differential equation solving

Teaching & Tutoring

- Extensive experience in explaining physics concepts to non-majors and the general public
- Emphasizes depth of understanding and teaching students how to learn independently

Employment

Graduate Student Researcher, UC Davis

July 2021–

- Researcher in Dr. Andrew Wetzel’s group. Performs analysis of cosmological zoom-in simulations of Milky Way-like galaxies. Current research includes analysis of element abundance patterns in MW-like galaxies.

Teaching Associate, UC Davis

September 2020–

- ‘Discussion lab’ instructor for PHY 7 (General Physics)
- Grader & TA for PHY 45 (Computational Physics), PHY 158 (Formation of Galaxies & Cosmic Structures)

Graduate Research Assistant, CSULB

July 2019–August 2020

- Researcher in Dr. Prashanth Jaikumar’s group. Participates in astrophysics research, including programming and numerical analysis

Graduate Assistant & Teaching Associate, CSULB August 2017–June 2019

- Telescope operator for weekly “Nights at the Observatory” outreach program
- Instructor for PHYS100BL (General Physics Lab) and PHSC112 (Intro to Physical Science Lab)

Museum Guide, Griffith Observatory August 2012–March 2020

- Gives presentations about exhibits and answers questions from guests at the historic Griffith Observatory in Los Angeles

Awards & Scholarships

Kennedy Reed Award, American Physical Society Far West Section November 1-2, 2019

- Best Theoretical Research by a Graduate Student - First Place

Summer Research Assistantship, CSULB Dept. of Physics and Astronomy Summer 2019

- Summer research support awarded to 2 students annually

Talks & Presentations

Santa Cruz Galaxy Workshop August 4-August 8, 2025

- “Alpha Element Bimodality in the FIRE Simulations” (Oral Presentation)

STScI Spring Symposium - Inter+Stellar: Harnessing the Intersection Between Stars and the Interstellar Medium May 12-May 16, 2025

- “Alpha Element Bimodality in the FIRE Simulations” (Oral Presentation)

GalFRESKA (Galaxy Formation and Evolution in Southern California) September 19-20, 2024

- “Alpha Element Bimodality in the FIRE Simulations” (Oral Presentation)

Santa Cruz Galaxy Workshop July 29-August 2, 2024

- “Alpha Element Bimodality in the FIRE Simulations” (Oral Presentation)

GalFRESKA (Galaxy Formation and Evolution in Southern California) September 18-19, 2023

- “Alpha Element Bimodality in the FIRE Simulations” (Oral Presentation)

Santa Cruz Galaxy Workshop August 7-11, 2023

- “Predicting dark subhalo populations around the Milky Way” (Oral Presentation)

Astronomy on Tap, Davis September 29, 2022

- “The Milky Way’s Invisible Neighbors” (Public Talk)

GalFRESKA (Galaxy Formation and Evolution in Southern California) September 6-7, 2022

- “Predicting Dark Matter Subhalo Populations Around Milky Way-Mass Galaxies” (Oral Presentation)

APS Far West Section Meeting November 1-2, 2019

- “Identifying the Quark-Hadron Phase Transition in Neutron Stars with g -modes” (Oral Presentation)
- Recipient of Kennedy Reed Award for Best Theoretical Research by a Graduate Student

CSULB Student Research Symposium September 20, 2019

- “Impact of the Tsallis Distribution on the Thermodynamics of Fermions” (Poster)

CSULB Student Research Competition February 22, 2019

- “ g -mode Oscillations in Neutron Stars” (Oral Presentation)

APS Far West Section Meeting October 18-20, 2018

- “ g -mode Oscillations in Neutron Stars” (Oral Presentation)