Megan Barry

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Education

Ph.D. Candidate, Physics, University of California - Davis (UCD), fourth-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

LMC-driven anisotropic boosts in stream–subhalo interactions Submitted to ApJ
- Arora, A.; Garavito-Camargo, N.; Sanderson, R.; Cunningham, E.; Wetzel, A.; Panithanpaisal, N.; Barry, M.

The dark side of FIRE: predicting the population of dark matter subhaloes around Milky Way-mass galaxies May 2023
- 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 December 2020
- 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, Fortran, Mathematica, G (LabVIEW), C, 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

GalFRESCA (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)

GalFRESCA (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)