Monica Gallegos-Garcia

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Education

Northwestern University
PhD student, Astronomy, 2018-present
Advisor: Professor Vicky Kalogera

University of California, Santa Cruz
Bachelor of Science, Physics (Astrophysics), 2018
Advisor: Professor Enrico Ramírez-Ruiz

Publications

Gallegos-Garcia M., Berry C. P. L., Kalogera V., *Evolutionary Origins of Binary Neutron Star Mergers*, in prep

Gallegos-Garcia M., Fishbach M., Doctor Z., Berry C. P. L., Kalogera V., *Do High-spin High-mass X-ray Binaries contibute to the Binary Black Hole Merger Population*, 2022 ApJL, 938, 19

Gallegos-Garcia M., Berry C. P. L., Marchant P., Kalogera V., *Binary Black Hole Formation with Detailed Modeling: Stable Mass Transfer Leads to Lower Merger Rates*, 2021 ApJ, 922, 110

Marchant P., Pappas K., **Gallegos-Garcia M.**, et al. *The role of mass transfer and common envelope evolution in the formation of merging binary black holes*, 2020, A&A, 650, A107

Gallegos-Garcia M., Burkhart B., Rosen A. L., Naiman J. p., Ramírez-Ruiz E., *Winds in Star Clusters Drive Kolmogorov Turbulence*, 2020 ApJL, 899, L30

Gallegos-Garcia M., Law-Smith, J., Ramírez-Ruiz E., *Tidal Disruptions of Main Sequence Stars of Varying Mass and Age: Inferences from the Composition of the Fallback Material*, 2018 ApJ, 857, 109

Invited Talks

Rate, Spins, and the Formation of Binary Black Holes,
Introduction to Graduate Education, Research Session Talk - Northwestern University, September 2022

Do high-spinning high-mass X-ray binaries contribute to the population of merging binary black holes?,
Astrophysics, Gravitation, and Cosmology Seminar - University of Illinois at Urbana-Champaign, Astronomy Department, March 2022

The Impact of Improved Stellar and Binary Physics on Binary Black Hole Mergers,
University of Wisconsin, Madison - Astronomy Department, November 2020

Awards

2022 Edward A. Bouchet Graduate Honor Society Inductee, Northwestern University, $2,000

2019 Ford Foundation Predoctoral Fellowship $78,000 over 3 years

Dean's Undergraduate Thesis Award 2019, for senior thesis and outstanding achievements in the Astrophysics major

Highest Honors in Major, Department of Physics and Astronomy, University of California, Santa Cruz, Spring 2018

Marilyn Stevens Memorial Scholarship. For contributions to the physics department and to the UCSC community, University of California, Santa Cruz, Spring 2018

Top Honors Poster Award. For exceptional poster presentation at the UC LEADS research symposium, University of California, Santa Barbara, Fall 2017

Educational Opportunity Programs (EOP) Honors, University of California, Santa Cruz, Fall 2017

Dean's Honors List, University of California, Santa Cruz, Fall 2015 - Spring 2018

Julie Packard Donation Recipient, Selected to receive funding for undergraduate research. University of California, Santa Cruz, 2016

Presentations

High-spin High-mass X-ray Binaries and Spins of Merging Binary Black Holes, Discussion co-leader at the Center for Astrophysics, Harvard University, August 2022

Do high-spinning high-mass X-ray binaries contribute to the population of merging binary black holes?, Discussion at Center for Computational Astrophysics, Flatiron Institute, July 2022

Do high-spinning high-mass X-ray binaries contribute to the population of merging binary black holes?, Talk at IMBH conference, May 2022

Understanding Merging Binary Black Holes, Talk, Bouchet 3 Minute Thesis Speaker Series at Northwestern University, April 2022

Binary Black Hole Formation with Detailed Modeling: Stable Mass Transfer Leads to Lower Merger Rates, Talk at Midwest Relativity Meeting, November 2021

Binary Black Hole Mergers in Rapid Population-synthesis Codes and the Impact of Improved Modeling of Binary Physics, Talk at European Astronomical Society Annual Meeting, June 2021

Binary Black Hole Merger Rates in Rapid Population-synthesis Codes and the Impact of Improved Modeling of Binary Physics, Poster at Triple Evolution and Dynamics 3 Conference, March 2021

The Impact of Improved Stellar and Binary Physics on Binary Black Hole Mergers, Talk at Conference of Ford Fellows, October 2020

The Impact of Improved Stellar and Binary Physics on Binary Black Hole Mergers, Talk at American Physical Society Spring Meeting, April 2020

Revisiting the treatment of common-envelope evolution in population-synthesis codes, Poster at The Deaths & Afterlives of Stars Conference, Space Telescope Science Institute, April 2019

Tidal Disruptions of Main Sequence Stars: Inferences from the Composition of the Fallback Material, Poster at UC LEADS Symposium, UC Santa Barbara, March 2018

Tidal Disruptions of Main Sequence Stars: Inferences from the Composition of the Fallback Material, Poster at American Astronomical Society, January 2018

Stellar Winds in Star Clusters and Their Effects on the Interstellar Medium,
Talk at Harvard-Smithsonian Center for Astrophysics, Harvard University, August 2017

Revisiting the Evolution of Flares Ignited By Supermassive Black Holes,
Poster at SACNAS Conference, Long Beach, CA, October 2016

Revisiting Flares Ignited by Supermassive Black Holes, Poster at Undergraduate Research Symposium, UC Santa Cruz, August 2016

Service, Outreach, and Advocacy

Research Experiences in Astronomy at CIERA for High School Students (REACH) program, Summers 2020, 2021, 2022
Created mini-project tutorial for high school students. Worked one-on-one with high school student to identify progenitors binary black hole mergers.

Speaker, Career Day at Lincoln Elementary School, Los Angeles Unified School District, May 2022

Secretary and Co-Chair of Communications, Comunidad Latinx, Northwestern University, 2019-2022

The Graduate School Diversity Peer Mentor, Northwestern University, 2020-2021
Mentored incoming first-year student

Onaketa Tutor, Invited to be part of Onaketa, a non-profit organization that partners with Bay Area schools and organizations to provide free tutoring to under-served students of color. January - June 2021

Panelist, The In's and Out's of Graduate Fellowship Applications, Northwestern University, Oct. 2020

Adler Planetarium Latinx Heritage Month, October 2019
Presented research and personal experience to Latinx Chicago community

Panelist, Life After College Conference, University of California, Santa Cruz, 2018 and 2019

Letters to a Pre-scientist, 2019-2020
Participated in a pen-pal program with middle school students to encourage science learning and education

Founder of the Underrepresented Minorities in STEM Journal Club (Social Justice Journal Club), STEM Diversity Programs, University of California, Santa Cruz, Spring 2018

Banneker and Aztlán Institute Peer Mentor, Harvard University, Summer 2018
Served as a peer mentor for two student in the Banneker and Aztlán Institute cohort of 2018.

STEM Diversity Programs Tutor, Introductory Physics: Electricity and Magnetism,

University of California, Santa Cruz, 2017-2018

UCSC Volunteer, Harbor High School, Santa Cruz, November 2017
Assisted local Spanish-speaking students complete college applications.

Research Experience

Graduate Research, Northwestern University
Advisors: Prof. Vicky Kalogera, Prof. Zoheyr Doctor, Prof. Christopher Berry, Jan 2019 - present
Studying compact object populations and merger progenitors with detailed stellar and binary evolution simulations.

Summer Research, Center for Astrophysics, Harvard University, 2018
Advisors: Dr. Blakesley Burkhart, Dr. Jill Naiman, Dr. Anna Rosen, Prof. Enrico Ramírez-Ruiz
Studied stellar wind interactions in different types of star clusters using the FLASH code. Specifically interested in the evolution of turbulence and kinetic energy injection scales in our simulations.

Undergraduate Research Fellow, UCSC Supercomputer Lab for Undergraduates
Advisors: Prof. Enrico Ramírez-Ruiz and Jamie Law-Smith, Nov. 2015 - Aug. 2018
Developed an analytical formalism to study the element abundance variations of the fallback material during tidal disruption events of main sequence stars of differing masses and ages.

Summer Research, Banneker and Aztlán Institute, Center for Astrophysics, Harvard University, 2017
Advisors: Dr. Blakesley Burkhart, Dr. Jill Naiman, Prof. Enrico Ramírez-Ruiz, Prof. Jorge Moreno
Studied stellar wind interactions in different types of star clusters using the FLASH code. Specifically interested in the evolution of turbulence and kinetic energy injection scales in our simulations.

Lamat Research Fellow, Lamat Research Experience for Undergraduates, UCSC, 2016
Advisors: Jamie Law-Smith, Prof. Enrico Ramírez-Ruiz
Developed code to analytically describe the accretion rate of tidal disruption events for stars of varying polytropic index.

Additional Experience

Coda/Astro, Summer 2022

Research Communication Training Program, Summer 2022

MESA Summer School, Summer 2019

STEM Transfer Support Assistant, UCSC, Sept 2015-June 2016

Alumni Engagement Intern, UCSC University Relations, March 2015-Dec 2015

Administrative Assistant, Greater West Covina Business Association, West Covina, CA, Feb 2014-Sept 2014

Languages

English, Spanish, Python,