Christine Mazzola Daher

Ph.D. Candidate *(She/Her, US Citizen)*
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Research focus: stellar multiplicity statistics and their correlations with stellar properties

Education

Mississippi State University Fall 2012 – Spring 2016

B.S. Physics, Mathematics minor
Summa cum laude (GPA: 3.93)

University of Pittsburgh Fall 2016 – Spring 2022

M.S. Physics *(Fall 2016 – Spring 2018)*

Ph.D. Physics *(expected April 2022, GPA: 3.67)*
Advisor: Prof. Carles Badenes
Dissertation: Stellar Multiplicity Statistics in APOGEE

Research Experience

Graduate Student Researcher, Pitt Summer 2017 – Present
Research Advisor: Prof. Carles Badenes
Topics: Doctoral research on stellar multiplicity using APOGEE radial velocity, surface gravity, effective temperature, chemical abundance, stellar rotation speed, mass, and stellar age measurements. Developed a Monte Carlo script to simulate radial velocity observations of binary star systems in order to understand completeness and selection effects in APOGEE targeting strategies.

Undergraduate Student Researcher, Miss. State Summer 2015
Research Advisor: Prof. Jim Dunne
Topics: Wrote a script in C to evaluate the thermodynamic performance of a heater for the cryogenic hydrogen system of targets at the Thomas Jefferson Accelerator Facility.

Undergraduate Research Assistant, Miss. State Summer 2013 – Spring 2016
Research Advisor: Jim Gafford
Topics: Managed the Advanced Electronics Laboratory in the Center for Advanced Vehicular Systems. Built prototype circuit boards from copper-coated fiberglass sheets using the lab's milling machine, soldered the boards' components, and assisted with prototype testing. Completed training in ITAR compliance. Characterized a Simulink model file for a vehicle's powertrain as part of an externally funded Army project.

Mentoring and Supervision

Undergraduate Research	Co-supervised Victoria Bonidie and Polina Petrov *Constraining UV Excess in APOGEE RV Variables*	Summer 2019
	Co-supervised Jakob Bindas *The Closest Surviving Companions of APOGEE RC Stars*	Fall 2021 – Present
Graduate Research	Co-supervised Victoria Bonidie and Travis Court *Stellar Multiplicity in the Sag. Stream vs. the Milky Way (publication in prep.)*	Spring 2021 – Present
Mentoring	Dept. Physics & Astronomy TA/TF Mentor	Fall 2020 – Summer 2021
	Dept. Physics & Astronomy Graduate Student Mentor *In three years, mentored ten first-year graduate students*	Fall 2018 – Summer 2021

Honors and Awards

Fellowships	Peter F. M. Koehler Predoctoral Fellowship, Dietrich School, Pitt *Awarded for excellence in teaching and exceptional research promise*	Fall 2019 / Summer 2020
	Predoctoral Summer Research Fellowship, Dietrich School, Pitt	Summer 2017
Scholarships	Crow Scholarship, Dept. Physics and Astronomy, Miss. State	Fall 2015 – Spring 2016
	Rundel Scholarship, Dept. Physics and Astronomy, Miss. State	Fall 2013 – Spring 2015
	Grillot Scholarship, Dept. Physics and Astronomy, Miss. State	Fall 2012 – Spring 2013
Honor Societies	Miss. State Society of Scholars	Spring 2016
	Miss. State Shackhouls Honors College	Fall 2012 – Spring 2016
Competitions	3 Minute Thesis Winner, Dept. Physics and Astronomy, Pitt	Spring 2019 / Spring 2020

Conferences, Workshops, and Presentations

Invited Talks	Astrolunch Seminar Series, Pitt	Dec. 2020
Contributed Talks	SDSS 2021 Collaboration Meeting, Johns Hopkins U.	Aug. 2021
	SDSS 2020 Collaboration Meeting, New York, USA	June 2020
	Pitt "Astrosnacks" Student Seminar	Feb. 2018 / Nov. 2018
Posters	SDSS 2019 Collaboration Meeting, Ensenada, Mexico	June 2019
Attended	Women in Medicine and Science Forum, Pitt	Nov. 2019
	Negotiation and Management Workshop for Women in Sciences, Pitt	Nov. 2019
	APOGEE Stellar Companions Paper Sprint, UVA	Oct. 2019
	LSST Community Brokers Workshop, Seattle, Washington	June 2019
	APS Conference for Undergraduate Women in Physics, Georgia Tech	Jan. 2016
	APS Conference for Undergraduate Women in Physics, U. Mississippi	Jan. 2015

Teaching

Instructional	Pitt AstroPGH Research Boot Camp Instructor *Two-part series on plotting with Matplotlib*	May 2020
	Carnegie Mellon U. "Astrosnacks" Student Seminar Title: *Python Plotting 101*	Sept. 2019
Graduate TA	PHYS 091: Conceptual Physics	Spring 2020
	ASTRON 088: Stonehenge to Hubble	Spring 2019
	ASTRON 089: Stars, Galaxies, and the Cosmos	Fall 2016 / Spring 2017 / Spring 2019
Lab Supervisor	ECE 4653/6653: Introduction to Power Electronics	Spring 2015 / Spring 2016

Professional Skills and Memberships

Computer Languages	Python, C, Fortran, R, LaTeX
Tools	git, Mathematica, Maple, MATLAB/Simulink, Microsoft Office
Techniques	Monte Carlo, autoencoders, soldering
Memberships	Sloan Digital Sky Survey IV: APOGEE-2 Survey
	Sloan Digital Sky Survey V
	Pitt Women and Minorities in Physics student group

Publications

⋆ – First or Second Author; *2 First Author, 4 N^{th} Author*

6. ⋆ *Stellar Multiplicity and Stellar Rotation: Insights from APOGEE*
Daher, C. M., Badenes, C., Tayar, J., Pinsonneault, M., Koposov, S. E., Kratter, K., Moe, M., Anguiano, B., Godoy-Rivera, D., Majewski, S., Carlberg, J. K., Walker, M. G., Buttry, R., Dixon, D., Serna, J., Stassun, K. G., De Lee, N. M., Hernández, J., Nitschelm, C., Stringfellow, G. S., Troup, N. W., *submitted to MNRAS (arXiv:2110.01100)*

5. *Stellar Kinematics of Dwarf Galaxies from Multi-Epoch Spectroscopy: Application to Triangulum II*
Buttry, R., Pace, A. B., Koposov, S. E., Walker, M. G., Caldwell, N., Kirby, E. N., Martin, N. F., Mateo, M., Olszewski, E. W., Starkenburg, E., Badenes, C., **Daher, C. M.**, *submitted to MNRAS (arXiv:2108.10867)*

4. *Close Substellar-Mass Companions in Stellar Wide Binaries: Discovery and Characterization with APOGEE and Gaia DR2*
Lewis, H. M., Anguiano, B., Majewski, S., Nidever, D. L., Badenes, C., De Lee, N., Hasselquist, S., **Daher, C. M.**, Stassun, K. G., Bizyaev, D., Godoy-Rivera, D., Nitschelm, C., Oravetz, A., Pan, K., Roman-Lopes, A. (2021) *MNRAS in press (https://doi.org/10.1093/mnras/stab2349)*

3. *Analysis of Previously Classified White-Dwarf-Main-sequence Binaries Using Data from the APOGEE Survey*
Corcoran, K. A., Lewis, H. M., Anguiano, B., Majewski, S., Kounkel, M., McDonnal, D. J., Stassun, K. G., Cunha, K., Smith, V., Allende Prieto, C., Badenes, C., De Lee, N., **Mazzola, C. N.**, Longa-Peña, P., Roman-Lopes, A. (2021) *AJ, 161, 143*

2. ⋆ *The Close Binary Fraction as a Function of Stellar Parameters in APOGEE: A Strong Anticorrelation with α Abundances*
Mazzola, C. N., Badenes, C., Moe, M., Koposov, S. E., Kounkel, M., Kratter, K., Covey, K., Walker, M. G., Thompson, T. A., Andrews, B., Freeman, P. E., Anguiano, B., Carlberg, J. K., De Lee, N. M., Frinchaboy, P. M., Lewis, H. M., Majewski, S., Nidever, D., Nitschelm, C., Price-Whelan, A. M., Roman-Lopes, A., Stassun, K. G., Troup, N. W. (2020) *MNRAS, 499, 1607*

1. ⋆ *Stellar Multiplicity Meets Stellar Evolution and Metallicity: The APOGEE View*
Badenes, C., **Mazzola, C.**, Thompson, T. A., Covey, K., Freeman, P. E., Walker, M. G., Moe, M., Troup, N., Nidever, D., Allende Prieto, C., Andrews, B., Barbá, R. H., Beers, T. C., Bovy, J., Carlberg, J. K., De Lee, N., Johnson, J., Lewis, H., Majewski, S. R., Pinsonneault, M., Sobeck, J., Stassun, K. G., Stringfellow, G. S., Zasowski, G. (2018) *ApJ, 854, 147*