

Christine Mazzola Daher

She/Her

Ph.D. Candidate

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Dept. Physics and Astronomy

University of Pittsburgh
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US Citizen

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 (*in progress, 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.

PUBLICATIONS (2 First Author, 4 Nth Author)

★ – First or Second Author

6. ★ *Stellar Multiplicity and Stellar Rotation: Insights from APOGEE*

Daher, C. M., Badenes, C., Tayar, J., Pinsonneault, M., Koposov, S. E., Anguiano, B., Buttry, R., Carlberg, J. K., De Lee, N. M., Godoy-Rivera, D., Hernández, J., Majewski, S., Nitschelm, C., Serna, J., Stassun, K. G., Stringfellow, G. S., Troup, N. W., Walker, M. G., *in SDSS collaboration review*

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

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, UM	Jan. 2015

MENTORING AND SUPERVISION

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

HONORS AND AWARDS

FELLOWSHIPS	Peter F. M. Koehler Predoctoral Fellowship, Dietrich School, Pitt <i>Awarded for excellence in teaching and exceptional research promise</i> Predoctoral Summer Research Fellowship, Dietrich School, Pitt	Fall 2019 / Summer 2020 Summer 2017
SCHOLARSHIPS	Crow Scholarship, Dept. Physics and Astronomy, Miss. State Rundel Scholarship, Dept. Physics and Astronomy, Miss. State Grillot Scholarship, Dept. Physics and Astronomy, Miss. State	Fall 2015 – Spring 2016 Fall 2013 – Spring 2015 Fall 2012 – Spring 2013
HONOR SOCIETIES	Miss. State Society of Scholars Miss. State Shackhous Honors College	Spring 2016 Fall 2012 – Spring 2016
COMPETITIONS	3 Minute Thesis Winner, Dept. Physics and Astronomy, Pitt	Spring 2019 / Spring 2020

TEACHING

INSTRUCTIONAL	Pitt AstroPGH Research Boot Camp Instructor <i>Two-part series on plotting with Matplotlib</i> Carnegie Mellon U. “Astrosnacks” Student Seminar Title: <i>Python Plotting 101</i>	May 2020 Sept. 2019
GRADUATE TA	PHYS 091: Conceptual Physics ASTRON 088: Stonehenge to Hubble ASTRON 089: Stars, Galaxies, and the Cosmos	Spring 2020 Spring 2019 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, L ^A T _E X, markdown
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