

SAMANTHA LUCÍA GARZA

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EDUCATION

University of Washington-Seattle

PhD, Astronomy

Expected, June 2025

- What Does C IV Reveal About the Ionization State of the CGM? - Thesis Advisor: Jessica Werk

Masters of Science, Astronomy

2023

University of Dallas

Bachelors of Science, Physics - Magna Cum Laude

2021

RESEARCH EXPERIENCE

University of Washington-Seattle

Research Assistant: Led the spectral analysis for 2 Hubble Space Telescope Proposals

2021-Present

- [CIViL* \(#17076\)](#): Worked with Dr. Jess Werk, Dr. Trystyn Berg (PI), Dr. Yakov Faerman and the CIViL* Collaboration to amplify the diagnostic power of the current COS-CGM samples through the acquisition of 11 new C IV observations for L* galaxies. Results indicated that C IV exhibits a dichotomous relationship in L* star-forming & passive galaxies, similar to that of O VI.
- [COS-Holes \(#16650\)](#): Worked with Dr. Jess Werk (PI) and the COS-Holes Collaboration to examine the observed relationship, if any, between black hole growth over long timescales (parameterized by a dynamically measured SMBH mass) and the gas content and kinematics within the extended halos of galaxies. Results indicate that C IV does not show obvious variation as a function of the SMBH mass.

Center for Astrophysics | Harvard & Smithsonian

NSF Research Intern, Advisor: Matthew Ashby

2020-2021

Combined broadband imaging with interferometric CO spectroscopy to measure giant molecular cloud (GMC) dust-to-gas ratios throughout M51. Developed a spectral energy distribution model to perform a modified two-component blackbody fit to calculate GMC dust masses.

National Radio Astronomy Observatory

NSF Research Intern, Advisor: Amanda Kepley

2019-2020

Examined how the star formation efficiency of the dense gas ratio (SFR/HCN) and the dense gas fraction (HCN/CO) depend on the galaxy environment using preliminary data from the Dense Extragalactic GBT+Argus Survey (DEGAS). Assisted with the development of DEGAS data reduction pipeline. Preliminary results showed a linear relation between SFR and HCN and a positive correlation between the star formation efficiency of molecular gas and the dense gas fraction.

National Astronomy Consortium - University of Wisconsin-Madison

NSF Research Intern, Advisor: Robert Benjamin

2018-2019

Built a computational model of the inner arms of the Milky Way using estimated distances to star formation regions & masers.

University of Wisconsin-Madison

NSF Research Intern, Advisor: Ben Rosenwasser

2018

Searched for and cataloged collisional and polar ring galaxies using images from the Subaru Telescope. Co-author on [AAS 233 Poster Presentation](#).

University of Dallas

Undergraduate Student Researcher, Advisor: Richard Olenick

2018

- Modeled photometric light curves of un-cataloged Algol binaries from Kepler K2 campaigns using PHOEBE.
- Gathered new transit measurements for WASP 43b and HD 189733b. Results were presented at the National Undergraduate Research Week: Science Poster Session at the University of Dallas.

PUBLICATIONS

- *Gas in the Zone of Avoidance: Pinpointing the Physical Conditions of Gaseous Halos* (ApJ, Garza et al. in prep)
- *The CIViL* Survey: The Discovery of a CIV Dichotomy in the CGM of L* Galaxies* ([ApJ Letters, Garza et al. 2024](#))
- *The COS-Holes Survey: Connecting Galaxy BH Mass with the State of the CGM* ([ApJ, Garza et al. 2024](#))
- *New Transit Measurements of WASP 43b and HD 189733b* ([RTSRE Proceedings, Olenick et al 2019](#))

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TEACHING & MENTORING EXPERIENCE

Teaching Assistant

2018-2022

- *University of Washington*: Taught 3 classes per quarter; encouraged discussions and facilitated lab work. Collaborated with professors to improve course material. Developed/presented a 1 hour lecture on black holes for Astronomy 101.
- *University of Dallas*: Oversaw experiments & managed group observations. Over the pandemic, collaborated with professors to develop new protocols for moving the class to a virtual format. *Courses assisted*: Intro Physics I, II, & Astronomy.

Science Group Leader:

2023-Present

- Co-lead the Diffuse Gas Group (DIGG) through results of recently published papers, lead discussions on group members results, encouraged members to set and achieve their quarterly personal and research goals.

Pre-MAP Mentor

2022 & 2023

- Mentored 5 students in the Pre-Major in Astronomy Program ([Pre-MAP](#)) for two 5 week research projects. Strengthened students' coding skills and taught them how to interpret spectroscopic data. Through continued mentoring, I helped one of my students get accepted to a competitive research internship

CONFERENCE PRESENTATIONS

European Southern Observatory

- CGM-Chile 2024 Oral Presentation: [The Carbon Cycle of the CGM: Results from the COS-Holes & CIVIL* Surveys!](#) 2024

American Astronomical Society

- AAS 245 Dissertation Presentation: *What does C IV Reveal About The Ionization State of the CGM in L* Galaxies?* 2025
- AAS 241 Oral Presentation: [Connecting Galaxy Black Hole Mass with the State of the Circumgalactic Medium](#) 2023
- AAS 237 iPoster Presentation: [GMC Dust Masses and CO-to-dust Conversion Factors in the Whirlpool Galaxy](#) 2021
- AAS 235 Poster Presentation: [Quantifying the Relationship of Dense Gas and Star Formation with DEGAS](#) 2020
- AAS 233 Poster Presentation: [Star Formation in the 3 Kiloparsec Arms of the Milky Way](#) 2019

National Astronomy Consortium Conference

- NAC VIII Oral Presentation: [GMC Dust Masses and CO-to-dust Conversion Factors in the Whirlpool Galaxy](#) 2020
- NAC VII Oral Presentation: [Quantifying the Relationship of Dense Gas and Star Formation with DEGAS](#) 2018

PUBLIC TALKS

- National "ARCS Forward" Event: Thesis Work & Outreach Presentation 2025
- ARCS-Seattle Scholar Convocation: Thesis Work & Outreach Presentation 2024
- Astronomy on Tap-Seattle: [To the Milky Way... \(and Galaxies\) Beyond!](#) 2023
- Public Lecture at [Theodore Jacobsen Observatory](#): *Where in the Universe are We?* 2022

EDUCATION & PUBLIC OUTREACH HIGHLIGHTS

TAF@Saghalie Middle School Exoplanet Outreach 2024

Featured in Pacific Science Center [Career Corner](#) 2024

Pacific Science Center: Meet a Scientist Day 2023

[eSTEAM](#) Organizer and Tutor 2022-Present

- Co-developed Python Coding Lessons: Co-led 7 week coding camp 2024
- Co-developed Astrobiology [Labs](#): Co-lead two week astrobiology summer camp 2023

Astro On Tap-Seattle Co-Lead ([MC](#), [Social Media](#), Trivia) 2022-Present

University of Washington Planetarium Presenter 2022-Present

University of Dallas First Annual Science Week Organizer 2020

University of Dallas Open Observatory Nights Volunteer 2018 & 2020

University of Dallas Open Physics Lab Days Volunteer 2018 & 2020

Physics Demonstrations with Latinx 4th & 5th Graders 2018

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DEPARTMENTAL LEADERSHIP

University of Washington

- Prospective Student Visit Graduate Student Coordinator 2023-2024
- Astronomy Faculty Search/Hiring - Graduate Committee 2023
- Graduate-Undergraduate Relations Committee 2022
- Astronomy Graduate Admission Interviews 2022-Present

University of Dallas

- University of Dallas Society of Physics Students President 2020-2021
- University of Dallas Society of Physics Students Vice President 2019-2020
- University of Dallas Women in STEM Club Secretary 2020-2021
- Subject Editor for University of Dallas Journal of Science 2019-2021

AWARDS AND HONORS

UW Astronomy Department Outreach Award	2023
Seattle Chapter ARCS Foundation Scholarship	2021
Monostori Scholar Award	2021
AUI Board of Trustees NAC Bridge Scholarship	2021
Sigma Pi Sigma Honor Society	2021
University of Dallas Trustee Scholarship	2017
University of Dallas Department of Physics Scholarship	2017

TECHNICAL SKILLS

- *Research*: Python (7+ years of experience), Linux, LaTeX, Microsoft Office
- *Science Communication*: Audio and Video Editing ([TikTok](#), CapCut, Audacity), WorldWide Telescope

REFERENCES

Jessica K. Werk (PhD Advisor)
University of Washington
Seattle, WA, USA
jwerk@uw.edu

Yakov Faerman
University of Washington
Seattle, WA, USA
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James Davenport
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