GILLIAN DORA BELTZ-MOHRMANN

Current Position: Astrophysics PhD Candidate,
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RESEARCH INTERESTS

- Large-scale Structure
- Cosmology
- Galaxy-halo connection
- Small-scale galaxy clustering

EDUCATION

Ph.D., Astrophysics, Vanderbilt University — expected 2022
Advisor: Andreas Berlind
Thesis: *Developing an Accurate Probe of the Galaxy-Halo Connection: Baryonic Effects, Small-Scale Galaxy Clustering, and Halo Model Extensions*

M.A., Astrophysics, Vanderbilt University — 2018

B.A., Astrophysics, German, *cum laude*, Wellesley College — 2016
Advisors: Kim McLeod, James Battat

REFERENCES

Professor Andreas Berlind, Vanderbilt University — andreas.a.berlind@vanderbilt.edu
Professor Frank van den Bosch, Yale University — frank.vandenbosch@yale.edu
Professor Ferah Munshi, University of Oklahoma — ferahmunshi@gmail.com

ACADEMIC POSITIONS

Graduate Research Assistant, Vanderbilt University — 2016–present

LIGO Summer Undergraduate Research Fellow, Caltech — Summer 2015
Advisors: Prof. Alan Weinstein, Dr. Jonah Kanner

NSF Summer REU, University of Wyoming — Summer 2014
Advisor: Prof. Daniel Dale

Summer Research Fellow, Keck Northeast Astronomy Consortium, Williams College — Summer 2013
Advisor: Prof. Steven Souza

Undergraduate Research Assistant, Wellesley College — 2013–2016
Advisors: Prof. Kim McLeod, Prof. James Battat

PROFESSIONAL ROLES

Referee for Physics of the Dark Universe — 2021
Member of the N-Body Shop Collaboration — 2020–present
Co-Investigator & Allocation Manager of LasDamas Project on XSEDE — 2017–present
Member of the American Astronomical Society — 2015–present

HONORS & AWARDS

Vanderbilt Physics & Astronomy Dept. - Most Outstanding Student Publication Award — 2020
Vanderbilt Data Science Symposium - Graduate Student Poster Competition (1st place) — 2019
Vanderbilt Akunuri V. Ramayya Award for Outstanding Teaching Assistant — 2018
Vanderbilt Provost Graduate Fellowship — 2016–2021

Undergraduate Chambliss Astronomy Achievement Award (Honorable Mention) 2016
Wellesley College Sarah Frances Whiting Medal for Achievement in Astronomy 2014

GRANTS

XSEDE - Awarded 58.4k Node Hours (2.8M CPU hours) on Stampede2 2019, 2020
Vanderbilt Physics & Astronomy Dept. - McMinn Research Grants ($3,000 total) 2019, 2020
Vanderbilt College of Arts and Sciences - Graduate Summer Research Award ($1,900) 2018

TEACHING

Co-mentored high school student Caleigh Dennis 2017–2019
Two-time 1st place winner at Middle Tennessee Science & Engineering Fair
Graduate Teaching Assistant, Dept. of Physics & Astronomy, Vanderbilt University 2016–2019
Instructor for *Introductory Astronomy Lab*
Astronomy Tutor, Vanderbilt University Fall 2016
Private tutor for undergraduate students in *Introduction to Astronomy*
Supplemental Instruction Leader, Wellesley College 2014–2016
Lead problem-solving sessions for students in *Introductory Mechanics*
Physics Tutor, Wellesley College 2013–2016
Helproom and private tutor for all undergraduate physics courses

OUTREACH

AAS (virtual) Congressional Visits Day Sept. 2020
Science Day with Nashville Girl Scout Troop March 2019
Meet the Astronomer Night at Dyer Observatory Oct. 2018
Volunteer for Summer Academy at Vanderbilt for the Young July 2017
Vanderbilt Student Volunteers for Science Fall 2016
Whitin Observatory Volunteer, Wellesley College 2012–2016

SKILLS & EXPERIENCE

Programming Languages: PYTHON, C, MATLAB, BASH, GIT, LaTeX
Machine Learning: scikit-learn
Parallel Computing: MPI, OPENMP
High Performance Computing: Experience on Stampede2 supercomputer:
Running cosmological N-body simulations using GADGET-2 & GADGET-4
generating power spectra and initial conditions using CAMB and 2LPTIC,
identifying spherical overdensity halos using ROCKSTAR,
and running large MCMC parameter searches
Observing Experience:
$\sim$ 80 hours using 2.3 meter telescope at Wyoming Infrared Observatory
$\sim$ 80 hours using 0.6 meter telescope at Williams College
$\sim$ 200 hours using 0.6 meter telescope at Wellesley College
$\sim$ 100 hours using 8″ reflector telescopes at Wellesley College and Vanderbilt University
$\sim$ 100 hours using 6″ and 12″ historic refractor telescopes at Wellesley College

RECENT TALKS & POSTERS

Invited Talks
High-Energy and AstroPhysics Seminar, University of Utah Jan. 2022
Developing an Accurate Probe of the Galaxy-Halo Connection
Kavli Institute for Particle Astrophysics and Cosmology Seminar, Stanford University Dec. 2021
Developing an Accurate Probe of the Galaxy-Halo Connection

Kavli Institute for Cosmological Physics Seminar, University of Chicago Nov. 2021
Developing an Accurate Probe of the Galaxy-Halo Connection
Galaxies and AGN Journal Club talk, Johns Hopkins University July 2021
The impact of baryonic physics on the abundance, clustering, & concentration of halos
Galaxy Lunch talk, Yale University March 2021
The impact of baryonic physics on the abundance, clustering, & concentration of halos

Contributed Talks

Kavli Institute for Theoretical Physics: Galaxy-Halo Connection Across Cosmic Time Aug. 2020
HMF Discrepancies between Hydrodynamic and DMO Simulations
Universität Innsbruck: The Connection Between Galaxies and Dark Matter Halos March 2020
Taking Halo Modeling to the Next Level

Contributed Posters

The First Shanghai Assembly on Cosmology and Galaxy Formation Nov. 2019
Taking HOD Modeling to the Next Level: Results from SDSS & Hydrodynamic Simulations
Santa Cruz Galaxy Workshop Aug. 2019
Can We Ignore Baryons in Halo Modeling?

PUBLICATIONS

Refereed First & Second Author Publications: 5
Total Citations: 47

Submitted & Published

5. Szewciw, A. O., **Beltz-Mohrmann, G. D.**, Berlind, A. A., Sinha, M., 2021, "Toward Accurate Modeling of Galaxy Clustering on Small Scales: Constraining the Galaxy-Halo Connection with Optimal Statistics", The Astrophysical Journal, 926, 15

4. **Beltz-Mohrmann, G. D.**, Berlind, A. A., 2021, "The impact of baryonic physics on the abundance, clustering, and concentration of halos", The Astrophysical Journal, 921, 112

3. **Beltz-Mohrmann, G. D.**, Berlind, A. A., Szewciw, A. O., 2020, "Testing the Accuracy of Halo Occupation Distribution Modelling using Hydrodynamical Simulations", Monthly Notices of the Royal Astronomical Society, 491, 5771

2. Dale, D. A., **Beltz-Mohrmann, G. D.**, Egan, A. A., Hatlestad, A. J., Herzog, L. J., Leung, A. S., McLane, J. N., Phenicie, C., Roberts, J. S., Barnes, K. L., Boquien, M., Calzetti, D., Cook, D. O., Kobulnicky, H. A., Staudaher, S. M., van Zee, L., 2016, "Radial Star Formation Histories in Fifteen Nearby Galaxies", The Astronomical Journal, 151, 4

1. Souza, S. P., **Beltz-Mohrmann, G.**, Sami, M., 2014, "The Light Curve and Period of MT696", The Journal of the American Association of Variable Star Observers, 42, 154

In Preparation

1. **Beltz-Mohrmann, G. D.**, Szewciw, A. O., Berlind, A. A., Sinha, M., 2022, "Toward Accurate Modeling of Galaxy Clustering on Small Scales: Extensions to the Standard Halo Model", in preparation.