Gillian Dora Beltz-Mohrmann, PhD

Postdoctoral Fellow, Cosmological Physics & Advanced Computing Group, Argonne National Laboratory

Office: C145, Building 360, 9700 S. Cass Avenue, Lemont, IL 60439 **Phone:** (908) 577-2812
Email: gbeltzmohrmann@anl.gov **DOB:** February 4, 1994
Website: https://gbeltzmo.github.io **Citizenship:** United States
Research Interests: Large-scale structure, Cosmology, Galaxy-halo connection, Galaxy clustering

ACADEMIC POSITIONS

Postdoctoral Fellow, Argonne National Lab — August 2022–
Graduate Research Assistant, Vanderbilt University — 2016–2022

EDUCATION

Ph.D., Astrophysics, Vanderbilt University — 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

Dr. Andrew Hearin, Argonne National Laboratory — ahearin@anl.gov
Professor Andreas Berlind, Vanderbilt University — a.berlind@nsf.gov
Professor Ferah Munshi, George Mason University — fmunshi@gmu.edu

MEMBERSHIP

Dark Energy Spectroscopic Instrument (DESI) Collaboration — 2022–
LSST Dark Energy Science Collaboration (DESC) — 2022–
CAMELS Collaboration — 2022–
N-Body Shop Collaboration — 2020–
LasDamas Project (Co-Investigator & Allocation Manager on XSEDE) — 2017–
American Astronomical Society — 2015–

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

PUBLICATIONS

Refereed First & Second Author Publications: 6
Total Citations: 75

Submitted & Published

6. **Beltz-Mohrmann, G. D.**, Szewciw, A. O., Berlind, A. A., Sinha, M., 2023, "Toward Accurate Modeling of Galaxy Clustering on Small Scales: Halo Model Extensions and Lingering Tension", The Astrophysical Journal, 948, 100

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

RECENT TALKS & POSTERS

Invited Talks

KITP: Building a physical understanding of galaxy evolution with data-driven astronomy — Jan. 2023
Toward Accurate Modeling of Galaxy Clustering on Small Scales: Halo Model Extensions & Lingering Tension

CAMELS Workshop, Center for Computational Astrophysics — Dec. 2022
Toward Accurate Modeling of Galaxy Clustering on Small Scales: Halo Model Extensions & Lingering Tension

High-Energy and AstroPhysics Seminar, University of Utah — Jan. 2022
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

N-Body Shop Workshop — June 2022
Accurate Modeling of Galaxy Clustering on Small Scales

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

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

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

Conference for Undergraduate Women in Physics at Argonne National Lab — Jan. 2023
Volunteered to run a python workshop to teach students about coding and galaxy clustering
AAS (virtual) Congressional Visits Day — Sept. 2020
Spoke with state representatives about the importance of funding scientific research
Science Day with Nashville Girl Scout Troop — March 2019
Built bottle rockets and talked to girls about being an astronomer
Meet the Astronomer Night at Dyer Observatory — Oct. 2018
Gave a public talk about large-scale structure
Volunteer for Summer Academy at Vanderbilt for the Young — July 2017
Helped design week long python course for middle school students
Vanderbilt Student Volunteers for Science — Fall 2016
Gave monthly science demonstrations to middle school classes
Whitin Observatory Volunteer, Wellesley College — 2012–2016
Gave monthly public talks and telescope demonstrations

PRE-DOCTORAL POSITIONS

LIGO Summer Undergraduate Research Fellow, Caltech — Summer 2015
NSF Summer REU, University of Wyoming — Summer 2014
Summer Research Fellow, Keck Northeast Astronomy Consortium, Williams College — Summer 2013
Undergraduate Research Assistant, Wellesley College — 2013–2016