

## Gillian D. Beltz-Mohrmann, Ph.D.

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Citizenship: USA

<b>Professional Appointments</b>	<b>Postdoctoral Research Fellow - Argonne National Laboratory</b>	2022-
	Cosmological Physics and Advanced Computing Group	
	<b>Graduate Research Assistant - Vanderbilt University</b>	2016-2022
	Department of Physics & Astronomy	
<b>Education</b>	<b>Ph.D. - Vanderbilt University</b> , Nashville, TN	May 2022
	Ph.D. in Astrophysics	Advisor: Andreas Berlind
	Thesis: <i>Developing an Accurate Probe of the Galaxy-Halo Connection: Baryonic Effects, Small-Scale Galaxy Clustering, and Halo Model Extensions</i>	
	<b>B.A. - Wellesley College</b> , Wellesley, MA	May 2016
	B.A., <i>cum laude</i>	Advisors: Kim McLeod, James Battat
<b>Honors &amp; Awards</b>	Astrophysics major, German minor	
	<b>Most Outstanding Student Publication Award</b>	2020
	Vanderbilt Physics & Astronomy Department	
	<b>Graduate Student Poster Competition Winner</b>	2019
	Vanderbilt Data Science Symposium	
	<b>Akunuri V. Ramayya Award for Outstanding Teaching Assistant</b>	2018
	Vanderbilt Physics & Astronomy Department	
	<b>Provost Graduate Fellowship</b>	2016–2021
	Vanderbilt University	
<b>Grants</b>	<b>Undergraduate Chambliss Achievement Honorable Mention</b>	2016
	227th American Astronomical Society Meeting	
	<b>Sarah Frances Whiting Medal for Achievement in Astronomy</b>	2014
	Wellesley College	
<b>1st &amp; 2nd Author Publications</b>	<b>XSEDE Grant</b>	2019, 2020
	Awarded 58.4k total Node Hours (2.8M CPU hours) on Stampede2	
	<b>McMinn Research Grant</b>	2019, 2020
	Vanderbilt Physics & Astronomy Department (\$3,000 total)	
	<b>Graduate Summer Research Award</b>	2018
	Vanderbilt College of Arts and Sciences (\$1,900)	
<b>Submitted &amp; Published</b>		
Total Citations: 92		
6. <b>Beltz-Mohrmann, G. D.</b> , Szewciw, A. O., Berlind, A. A., Sinha, M., 2023, “Toward Accurate Modeling of Galaxy Clustering on Small Scales: Halo Model Extensions and Lingering Tension”, <i>The Astrophysical Journal</i> , 948, 100		
5. Szewciw, A. O., <b>Beltz-Mohrmann, G. D.</b> , Berlind, A. A., Sinha, M., 2021, “Toward Accurate Modeling of Galaxy Clustering on Small Scales: Constraining the Galaxy-Halo Connection with Optimal Statistics”, <i>The Astrophysical Journal</i> , 926, 15		
4. <b>Beltz-Mohrmann, G. D.</b> , Berlind, A. A., 2021, “The impact of baryonic physics on the abundance, clustering, and concentration of halos”, <i>The Astrophysical Journal</i> , 921, 112		
3. <b>Beltz-Mohrmann, G. D.</b> , Berlind, A. A., Szewciw, A. O., 2020, “Testing the Accuracy of Halo Occupation Distribution Modelling using Hydrodynamical Simulations”, <i>Monthly Notices of the Royal Astronomical Society</i> , 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

<b>Cosmology Talks Miniworkshop</b> (invited expert)	August 2024
<i>Cosmology Beyond 2pt Statistics</i>	
<b>DHWFEST</b> , University of Utah	July 2024
<i>A New Forward Model of the Galaxy-Halo Connection</i>	
<b>Summer DESI Meeting</b> , Marseille, France	July 2024
<i>Updates on the DESI Emulator Mock Challenge - Alternative Clustering Methods</i>	
<b>New Strategies for Extracting Cosmology from Galaxy Surveys</b>	July 2024
Sesto, Italy	
<i>Simulation-based Forward Modeling of Cross-Survey Cross-Correlations with Diffsky</i>	
<b>Fundamental Physics from Future Spectroscopic Surveys</b>	May 2024
Lawrence Berkeley National Lab	
<i>Making multi-wavelength, multi-redshift predictions for Cross-Survey Cosmological Analyses</i>	
<b>Winter DESI Meeting</b> , Hawaii, USA	Dec. 2023
<i>Introducing DESI-Diffsky: A Differentiable Forward Model for Making Multi-wavelength, Multi-tracer DESI Mocks</i>	
<b>KITP Workshop</b> , UC Santa Barbara	Jan. 2023
Building a physical understanding of galaxy evolution with data-driven astronomy	
<i>Toward Accurate Modeling of Galaxy Clustering on Small Scales: Halo Model Extensions &amp; Lingering Tension</i>	
<b>CAMELS Workshop</b> , Center for Computational Astrophysics	Dec. 2022
<i>Toward Accurate Modeling of Galaxy Clustering on Small Scales: Halo Model Extensions &amp; Lingering Tension</i>	
<b>N-Body Shop Workshop</b> , Center for Computational Astrophysics	June 2022
<i>Accurate Modeling of Galaxy Clustering on Small Scales</i>	
<b>High-Energy and AstroPhysics Seminar</b> , University of Utah	Jan. 2022
<i>Developing an Accurate Probe of the Galaxy-Halo Connection</i>	
<b>KICP Seminar</b> , University of Chicago	Nov. 2021
<i>Developing an Accurate Probe of the Galaxy-Halo Connection</i>	
<b>Galaxies and AGN Journal Club</b> , Johns Hopkins University	July 2021
<i>Impact of baryonic physics on the abundance, clustering, &amp; concentration of halos</i>	
<b>Galaxy Lunch talk</b> , Yale University	March 2021
<i>Can we ignore baryons in halo modeling?</i>	
<b>KITP Workshop</b> , UC Santa Barbara	Aug. 2020
Galaxy-Halo Connection Across Cosmic Time	
<i>HMF Discrepancies between Hydrodynamic and DMO Simulations</i>	
<b>Galaxy-halo Connection Workshop</b> , Universität Innsbruck	March 2020
<i>Taking Halo Modeling to the Next Level</i>	

## Mentoring

<b>DESI Mentorship Program</b>	Fall 2023 -
<i>Mentor for students in the DESI Collaboration</i>	
<b>GEM Fellowship Program</b> , Argonne National Laboratory	Summer 2023
<i>Mentored a graduate student in the GEM Fellowship program for 13 weeks; helped her develop a gradient descent pipeline in Jax for forward modeling galaxy SEDs.</i>	
<b>STEM Research Program</b> , Nashville, TN	2017 – 2019
<i>Mentored a student from Harpeth Hall High School for two years; taught her Python and guided her on a project measuring the rotation of galaxy groups in SDSS; 1st place winner at Middle Tennessee Science &amp; Engineering Fair in 2018 and 2019.</i>	

Teaching	<b>Conference for Undergraduate Women in Physics</b>	Jan. 2023
	Argonne National Lab	
	<i>Developed and lead several python workshops during the conference; taught students Python basics and introduced them to galaxy redshift data from SDSS</i>	
	<b>Graduate Teaching Assistant</b> , Vanderbilt University	Fall 2016 – Spring 2019
	<i>Introductory Astronomy Lab instructor: lectured on lab concepts; helped develop and improve lab material; taught students to use 8 inch telescopes; guided students with mini end-of-semester research project and poster session; graded labs and lecture exams (10 hours per week)</i>	
	<b>Astronomy Tutor</b> , Vanderbilt University	Fall 2016
	<i>Individual tutor for introductory astronomy lectures (1-2 hours per week)</i>	
	<b>Supplemental Instruction Leader</b> , Wellesley College	Fall 2014 – Spring 2016
	<i>Created supplemental lessons and material and lead extra problem solving sessions for introductory physics lectures (8 hours per week)</i>	
	<b>Physics Tutor</b> , Wellesley College	Fall 2013 – Spring 2016
Skills & Experience	<i>Worked through problems sets with students individually or in a group; helped students to understand concepts from lecture (4 hours per week)</i>	
	<b>Summer Academy at Vanderbilt for the Young</b>	July 2017
	<i>Developed material for a week-long course for middle school students to learn VPython and build a solar system simulation</i>	
	<b>Vanderbilt Student Volunteers for Science</b>	Fall 2016
	<i>Gave monthly chemistry and physics demonstrations to middle school classes</i>	
	<b>Programming Languages:</b> PYTHON, C, MATLAB, BASH, GIT, L <sup>A</sup> T <sub>E</sub> X	
	<b>Misc.:</b> scikit-learn, Jax, emcee	
	<b>Parallel Computing:</b> MPI, OPENMP	
	<b>Simulation Software:</b> GADGET, CAMB, 2LPTIC, ROCKSTAR	
	<b>Observing Experience:</b>	
Public Service & Outreach	~ 80 hours using 2.3 meter telescope at Wyoming Infrared Observatory	
	~ 80 hours using 0.6 meter telescope at Williams College	
	~ 200 hours using 0.6 meter telescope at Wellesley College	
	~ 100 hours using 8" reflector telescopes at Wellesley College and Vanderbilt University	
	~ 100 hours using 6" and 12" historic refractor telescopes at Wellesley College	
	<b>AAS Congressional Visits Day (virtual)</b>	Sept. 2020
	<i>Spoke with state representatives about the importance of funding scientific research</i>	
	<b>Science Day with Nashville Girl Scout Troop</b>	March 2019
	<i>Built bottle rockets and answered questions about being an astronomer</i>	
	<b>Meet the Astronomer Night at Dyer Observatory</b>	Oct. 2018
Professional Service	<i>Public talk and Q&amp;A</i>	
	<b>Whitin Observatory Volunteer</b> , Wellesley College	2012–2016
	<i>Gave monthly public talks and telescope demonstrations to guests of all ages</i>	
	<b>Committees:</b>	
	Argonne Young Scientist Symposium Series	Jun 2023 –
	<b>Scholarly Journal Peer Reviewer:</b>	
	Astronomy & Astrophysics	
	Journal of Cosmology and Astroparticle Physics	
	Physics of the Dark Universe	
	<b>Leadership:</b>	
Collaborations	LasDamas (Large Suite of Dark Matter Simulations) Collaboration	2017–2022
	<i>Co-Investigator &amp; XSEDE Allocation Manager</i>	
	<b>General Member:</b>	
	Dark Energy Spectroscopic Instrument Collaboration	2022–
	<i>C3 Working Group, Alternative Clustering Methods Topical Group</i>	
	LSST Dark Energy Science Collaboration	2022–

CAMELS Collaboration	2022–
N-Body Shop Collaboration	2020–
American Astronomical Society	2015–

**Nth Author  
Publications**

**Submitted & Published**

Total Citations: 2

2. Lange, Johannes U. et al., 2024, “Systematic Effects in Galaxy-Galaxy Lensing with DESI”, arXiv:2404.09397
1. Yuan, Sihan et al., 2024, “Redshift evolution and covariances for joint lensing and clustering studies with DESI Y1”, submitted to Monthly Notices of the Royal Astronomical Society, arXiv:2403.00915