

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

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Professional Appointments	Postdoctoral Research Fellow - Argonne National Laboratory	2022-
	Cosmological Physics and Advanced Computing Group	
	Graduate Research Assistant - Vanderbilt University	2016-2022
	Department of Physics & Astronomy	
Education	Ph.D. - Vanderbilt University, 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.A. - Wellesley College, Wellesley, MA	May 2016
	B.A., <i>cum laude</i>	Advisors: Kim McLeod, James Battat
	Astrophysics major, German minor	
Honors & Awards	Most Outstanding Student Publication Award	2020
	Vanderbilt Physics & Astronomy Department	
	Graduate Student Poster Competition Winner	2019
	Vanderbilt Data Science Symposium	
	Akunuri V. Ramayya Award for Outstanding Teaching Assistant	2018
	Vanderbilt Physics & Astronomy Department	
	Provost Graduate Fellowship	2016–2021
	Vanderbilt University	
	Undergraduate Chambliss Achievement Honorable Mention	2016
227th American Astronomical Society Meeting		
Sarah Frances Whiting Medal for Achievement in Astronomy		2014
	Wellesley College	
Grants	XSEDE Grant	2019, 2020
	Awarded 58.4k total Node Hours (2.8M CPU hours) on Stampede2	
	McMinn Research Grant	2019, 2020
	Vanderbilt Physics & Astronomy Department (\$3,000 total)	
	Graduate Summer Research Award	2018
Vanderbilt College of Arts and Sciences (\$1,900)		
1st & 2nd Author Publications	Submitted & Published	
	Total Citations: 92	
	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

<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 Laboratory	
	<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>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>Supplemental Instruction Leader</b> , Wellesley College	Fall 2014 – Spring 2016
Skills & Experience	<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
	<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>Programming Languages:</b> PYTHON, C, BASH, GIT, L <sup>A</sup> T <sub>E</sub> X	
	<b>Misc.:</b> scikit-learn, Jax, emcee, GADGET, CAMB, 2LPTIC, ROCKSTAR	
	<b>Parallel Computing:</b> MPI, OPENMP	
	<b>Observing Experience:</b>	
	~ 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	
Public Service & Outreach	~ 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>Science Careers in Search of Women Event</b>	March 2023
	Argonne National Laboratory	
	<i>Panelist for Women in STEM panel, as part of a broader event aimed at teaching high school girls about careers in science</i>	
	<b>Conference for Undergraduate Women in Physics</b>	Jan. 2023
	Argonne National Laboratory	
	<i>Led a python workshop, participated in Q&amp;A sessions, panel discussions, and net-working opportunities with students.</i>	
	<b>AAS Congressional Visits Day (virtual)</b>	Sept. 2020
	<i>Spoke with state representatives about the importance of funding scientific research</i>	
Professional Service	<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
	<i>Public talk and Q&amp;A</i>	
	<b>Vanderbilt Student Volunteers for Science</b>	Fall 2016
	<i>Gave monthly chemistry and physics demonstrations to middle school classes</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 –
Professional Service	<b>Scholarly Journal Peer Reviewer:</b>	
	Astronomy & Astrophysics	
	Journal of Cosmology and Astroparticle Physics	
	Physics of the Dark Universe	

<b>Collaborations</b>	<b>Leadership:</b>	
	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–

<b>Nth Author Publications</b>	<b>Submitted &amp; Published</b>	
	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	