Z. Brooks Howe

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Summary

Ph. D. Candidate at Auburn University interested in the application of data-driven methods and machine learning in the fields of dusty plasma, magnetized plasma, and fusion energy.

Keywords: Data-driven analysis, machine learning, artificial intelligence, dusty plasma, fusion plasma.

Publications and Recent Presentations

[1] Z. B. Howe, G. Oladipupo, E. DeCicco, *et al.*, "Sparse identification of anisotropic dust particle interaction from a molecular dynamics simulation of a complex plasma," In progress, 2027.

[2] Z. B. Howe, L. S. Matthews, T. Hyde, L. Guazzotto, and E. G. Kostadinova, "Sparse identification of effective microparticle interaction potential in dusty plasma from simulation data," *Physics of Plasmas*, vol. 33, no. 6, p. 063 703, Jun. 2026. DOI: 10.1063/5.0320634.

[3] Z. B. Howe, G. Oladipupo, E. DeCicco, *et al.*, "Sparse identification of interaction potential from molecular dynamics simulations of dust suspended in a plasma," Contributed oral presentation at the APS Global Physics Summit, Mar. 16 - 20, 2026.

Education

2022 - present	Ph. D. Physics at **Auburn University**, Auburn, AL	GPA: 4.0/4.0
2022 - 2024	M. S. Physics at **Auburn University**, Auburn, AL	GPA: 4.0/4.0
2018 - 2022	B. S. Physics at **Wittenberg University**, Springfield, OH	GPA: 3.9/4.0
2018 - 2022	B. A. Music at **Wittenberg University**, Springfield, OH	GPA: 4.0/4.0

Skills

Computer Experience	Python, object-oriented programming, git/GitHub, regression, machine learning, Mathematica, Particle Image Velocimetry
Communication	German language (conversational), Brazilian Portuguese language (intermediate)
Interpersonal Skills	I work well in a group and have a strong interest in developing personal relationships and a sense of community among colleagues.

Awards and Service

Southern Physics and Astronomy Graduate Student Symposium Spring 2026

I chaired the organizing committee for this graduate-student-only conference on April 25th, hosted this year at Auburn University. This unique conference brought over 90 students from Georgia, Alabama, and Mississippi to our campus to present research and foster community across the region.

APS Division of Plasma Physics Student Day Organizer Summer 2026 - present

Graduate student organizations at Auburn Fall 2022 - present

I have been a leader in the Graduate Auburn University Student Seminars (GAUSS), the Physics Graduate Student Association (PGSA), an unofficial student resource update committee, and the United Campus Workers of Alabama (UCW-CWA) Labor Union.

APS Forum on Graduate Student Affairs Member-at-Large Spring 2024 - present

Auburn U. Presidential Graduate Research Fellowship Fall 2022 - Spring 2025