

# WILLIAM BROKER

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<https://github.com/WilliamBroker>

Nationality: American, eligible to work in the US

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## SUMMARY

Physics major at Haverford College with experience in simulations of atomistic diffusion and of granular physics. Seeking to pursue a research career in quantum field theory and physics beyond the standard model.

## EDUCATION

**Haverford College**, Haverford, PA  
B.S., Physics; B.A., Music; GPA: 3.90 Expected May 2026

Relevant Coursework: *Electromagnetism, Linear Algebra, Optics and Waves, Scientific Computing (MATLAB), Quantum Physics I + II, Abstract Algebra, Advanced Classical Mechanics, Statistical Mechanics*

## SKILLS

**Computational:** Microsoft Office Suite Applications, Photoshop, Python, MATLAB, LATEX, LAMMPS, Mathematica, MobaXTerm, Linux, Ovito

**Languages:** English (native), Spanish (conversational)

## HONORS AND GRANTS

NSF Summer Research Funding Grant (2024)

## RESEARCH EXPERIENCE

### NNSA-IMPACT/Sandia National Labs

*Research Intern* June 2025 – present

Advisor: Dr. Juan Mendez-Granado

Under Dr. Juan Mendez-Granado, I am working with the LAMMPS programming language to simulate diffusion of delta-layer systems in transistor manufacturing to be used in beyond-Moore devices. I helped to design input scripts to simulate diffusion of Boron across a Silicon crystal, for which I am currently working on a paper for publication.

### Squishlab, Haverford College

*Research Fellow*

May 2024 – May 2025

**Advisor: Prof. Ted Brzinski**

Worked with Prof. Ted Brzinski in researching granular physics, particularly in relation to geological phenomena like soil liquefaction. Designed and built a device to deliver vibrations to soil with AutoCAD software for field deployment and investigated density of modes within ordered and disordered solids using a novel apparatus. Currently using LAMMPS to simulate packings of disordered solids and colloidal systems.

## **PRESENTATIONS**

APS Global Physics Summit 2026, American Physical Society, March 2026. “*Diffusive molecular dynamics simulations of boron diffusion in Si: B δ-layers*” (oral presentation).

Sandia Homecoming, Sandia National Labs, July 2025. “*Diffusive Molecular Dynamics: an Overview*” (oral presentation).

Summer Research Symposium, Haverford College, September 2024. “*Investigating Density of Modes in Granular Samples in Situ and in a ‘DoMinator’ Apparatus*” (poster).

## **LEADERSHIP AND COMMUNITY ACTIVITIES**

### **AFSC Emerging Leaders for Liberation**

*Fellow*

April — November 2024

Led a successful petition campaign to get local government to agree to stricter guidelines regarding energy usage and provide tax incentives for solar panel installation.