David Beckwitt, Ph.D.

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Professional Summary

PhD in **Condensed Matter Physics** specializing in **computational modeling** and **X-ray and neutron scattering** with **6 years of experience** in experimental design, structural characterization, and algorithm development.

Education

Ph.D. Physics, University of Missouri — 2026 (expected)
Dissertation: *Investigating Disorder in van der Waals Thin Films*

M.S. Physics, University of Missouri — 2022
B.S. Physics, Missouri State University — 2020

Research Experience

Graduate Research Assistant, University of Missouri — 2021–Present

- Built **Python** GIWAXS **Reverse Monte Carlo** simulations to extract occupancies, anisotropic DW factors, mosaicity, and geometry (APS Mar 2023).
- Extended and validated simulations of **structural disorder** from stacking faults in vdW films.
- **Grew phase controlled PbI_2** films via **chemical vapor deposition**; experimentally validated models (ACS Appl. Mater. Interfaces).
- Implemented **CNNs** in **PyTorch** for automated structural analysis.

Intern, NASA Space Consortium — 2019–2020

- **Synthesized graphene heterostructures** using PLD and PVD.

Research Assistant, Missouri State University — 2017–2020

- Designed and **built a PLD** system; characterized films via **XRD**, **SEM**, and **Raman** spectroscopy.

R&D Intern, Dynatek Labs — 2019

- **Developed software** for biomedical testing automation.

Selected Technical Projects

X ray Diffraction Simulator – GitHub: Quantitative Xray diffraction area detector simulation.
2D Mosaic Sim – GitHub: Interactive Xray diffraction animator.
OSC Reader – GitHub: Detector file converter tool.

Technical Skills

Languages: **Python**, C++, Fortran, R, SQL, Bash, LaTeX
Analysis: Monte Carlo, ML (**PyTorch**), **NumPy**, pandas
Tools: Git, MPI, **Matplotlib**, Plotly, Jupyter, **SEM**, Raman spectroscopy

Selected Publications

- Arendse *et al.*, **ACS Appl. Mater. Interfaces** 15, 56692 (2023). *Orientation and phase stability in halide perovskite films.*
- Beckwitt, **APS March Meeting** (2024). *Xray diffraction analysis of disorder in vdW films.*

Selected Leadership & Awards

VicePresident/President, Physics Graduate Association — 2022–2024
Outstanding Research Presentation, NSSA — 2023
Green Chalk Teaching Award, University of Missouri — 2023