

# David Beckwitt, Ph.D.

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## Professional Summary

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Physicist specializing in quantitative modeling, machine learning, and structural defect analysis of van der Waals (vdW) thin films. Experienced in X-ray/neutron scattering, thin film fabrication, and computational physics.

## Education

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**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

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**Graduate Research Assistant**, University of Missouri 2021–Present

- Developed **GIWAXS** simulations using Python and Monte Carlo methods.
- Extended and validated simulations with theory of **structural disorder**.
- Grew **CVD**-based PbI<sub>2</sub> films; experimentally validated with 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, Raman.

**R&D Intern**, Dynatek Labs 2019

- Developed software for biomedical testing automation.

## Selected Technical Projects

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**Xray Diffraction Simulator** [Github](#): Quantitative X-ray diffraction area detector simulation.

**2D Mosaic Sim**, [Github](#): Interactive X-ray diffraction animator.

**OSC Reader**, [Github](#): Detector file converter tool.

## Technical Skills

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**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

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- Arendse et al., [ACS Appl. Mater. Interfaces](#) **15**, 56692 (2023). *Study of orientation and phase stability in halide perovskite films.*
- Beckwitt, [APS March Meeting](#) (2024). *X-ray diffraction analysis of disorder in vdW films.*

## Selected Leadership & Awards

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**Vice-President/President**, Physics Graduate Association 2022–2024

**Outstanding Research Presentation**, NSSA 2023

**Green Chalk Teaching Award**, University of Missouri 2023