David Beckwitt, Ph.D.

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Professional Summary

Ph.D. candidate physicist specializing in quantitative modeling, experimental growth and characterization, and machine learning techniques. Specializing in **X-ray/neutron scattering**, thin-film growth, and structural analysis of van der Waals materials.

Education

Ph.D., Physics, University of Missouri — 2026 (expected)
Dissertation: *Disorder in van der Waals Thin Films* — Advisor: Paul Miceli
M.S., Physics, University of Missouri — 2022
B.S., Physics, Missouri State University — 2020

Technical Skills

Programming: Python, C++, Fortran, Git, SQL, MPI, Bash scripting, LaTeX
Analysis: Monte Carlo methods, **PyTorch (CNNs)**, **NumPy**, pandas, SciPy
Instrumentation: X-ray/neutron scattering, CVD, PLD, SEM, Raman spectroscopy
Visualization: Matplotlib, Plotly, OriginLab, Jupyter Notebooks, Blender

Research Experience

Graduate Researcher, University of Missouri — 2021–Present

- Developed **Python**-based GIWAXS toolkit, reducing structural analysis time by 50%.
- Grew phase-controlled thin films via **CVD**, achieving experimental validation within 5% of computational predictions.
- Implemented **CNN** models, improving classification accuracy of structural disorder by 25%.

Research Intern, NASA Space Consortium — 2019–2020

- Synthesized graphene-based heterostructures via **PLD** and **PVD**; validated structural properties with Raman and SEM, facilitating improved device reliability.

Research Assistant, Missouri State University — 2017–2020

- Designed PLD system, increasing thin-film deposition consistency; characterized films via XRD, SEM, Raman spectroscopy.

R&D Intern, Dynatek Labs — 2019

- Developed automation software for biomedical testing equipment, improving efficiency by 40%.

Selected Publications

- Arendse et al. (2023), *ACS Applied Materials & Interfaces*, 15, 56692. [DOI] (co-author)
- Beckwitt, *X-ray Diffraction Analysis of Disorder in vdW Films*, APS March Meeting (2024). (first author)

Awards & Leadership

- Outstanding Student Research Presentation, Neutron Scattering Society — 2023
- Green Chalk Teaching Award, University of Missouri — 2023
- President/Vice-President, Physics & Astronomy Grad Student Association — 2022–2024