

Amalya Johnson

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EDUCATION

Stanford University, Stanford, CA

Ph.D. 2025, Materials Science & Engineering

Columbia University, New York, NY

B.A. 2020, Physics

EXPERIENCE

Toyota Research Institute

2025–Present

Postdoctoral Researcher, Accelerated Materials Design & Discovery

- Develop multimodal machine learning frameworks to predict bulk material properties from simulated and experimental datasets, enabling accelerated materials discovery pipelines
- Integrate experimental and simulated datasets to uncover structure–property relationships across materials systems
- Build AI-driven workflows, combining data aggregation, feature extraction, and predictive modeling
- Collaborate across AI and materials science teams to design scalable, end-to-end frameworks for high-throughput characterization (XRD, UV-Vis)

Stanford University, Fang Liu Research Group

2020–2025

PhD Candidate, TomKat Graduate Fellow

- Studied two-dimensional (2D) semiconductor materials and heterostructures, focusing on thermal and electronic transport across atomic interfaces
- Designed and performed ultrafast optical spectroscopy and electron diffraction experiments on 2D monolayers and heterostructures
- Developed finite difference models in Python to simulate thermal transport across complex material interfaces
- Built Python-based data pipelines to analyze large experimental datasets (up to 1TB)

Toyota Research Institute

2024

Research Intern, Accelerated Materials Design & Discovery

- Developed a machine learning toolkit in Python (Scikit-Learn) to predict materials properties from high-dimensional spectroscopy datasets using interpretable machine learning models
- Created an interactive dashboard to deploy models, integrating data ingestion, prediction, and visualization for research and manufacturing teams
- Applied predictive models to manufacturing and academic spectroscopy data to understand relationships between spectral features and target properties

Lawrence Berkeley National Laboratory

2023

DOE Graduate Student Research Fellow

- Awarded US Department of Energy research fellowship to conduct doctoral research at Lawrence Berkeley National Laboratory, studying the ultrafast dynamics of semiconductor heterostructures with Archana Raja
- Led multi-institutional collaborations to secure experimental beamtime and execute advanced characterization studies

EXPERTISE

Multimodal Materials Modeling • Scientific Computing • 2D Materials • Materials Characterization (Raman, AFM, UV-Vis, Photoluminescence, TDTR) • Nanoscale Thermal & Electronic Transport

HONORS & AWARDS

TomKat Graduate Fellowship (2023–2025) • DOE Graduate Student Research Fellowship (2023)

EDGE Doctoral Fellowship (2020–2025)

SELECTED PUBLICATIONS (2/14)

Johnson, A. C. et al. Spectra-Scope: A toolkit for automated and interpretable characterization of material properties from spectral data. *arXiv:2603.06011* (2026).

Johnson, A. C. et al. Hidden phonon highways promote photoinduced interlayer energy transfer in twisted transition metal dichalcogenide heterostructures. *Science Advances* 10, eadj8819 (2024).