

Tomilola Obadiya

Email: tobadiy@emory.edu 2065 Powell Lane, Decatur, GA 30033 Mobile: 402-594-8712

Summary

Dynamic computational physicist with over 5 years of experience advancing scientific research through the development of machine learning models, agent-based simulations, and statistical analyses. Skilled in designing scalable, GPU-accelerated algorithms to tackle complex scientific problems, with a focus on generating actionable insights. Proven collaborator in interdisciplinary teams, contributing to innovative solutions and impactful research outcomes across diverse domains.

Education

| | |
|--|------------------------------------|
| Doctor of Philosophy, Physics <i>Emory University</i> <ul style="list-style-type: none">Advisor: Daniel M. Sussman | May 2025 Atlanta, Georgia |
| Master of Science, Physics <i>Creighton University</i> <ul style="list-style-type: none">Advisor: David Sidebottom | May 2019 Omaha, Nebraska |
| Bachelor of Science, Engineering Physics <i>Obafemi Awolowo University (OAU)</i> <ul style="list-style-type: none">Advisor: Marcus Eleruja | May 2015 Ile Ife, Osun, Nigeria |

Technical Skills & Tools

| |
|--|
| High-Performance Computing: CUDA, OpenCL, MPI, Nvidia Nsight |
| Machine Learning & Data Science: Tensorflow, PyTorch, Scikit-Learn, DeepSpeed, NumPy, SciPy, Matplotlib, Seaborn, MATLAB, SQL |
| Agent-Based Simulation: NetLogo, HOOMD-Blue, Open-Qmin |
| Programming & Software Development: Python, C/C++, Bash, Git |
| Cloud & Cluster Infrastructure: Google Colab, AWS ParallelCluster |
| Operating System: Linux, Windows, MacOS |

Soft Skills

| |
|--|
| Problem-Solving, Collaboration, Adaptability, Leadership and Initiative, Communication |
|--|

Projects & Relevant Experience

| | |
|--|----------------|
| GPU-Accelerated Active Nematic System Modeling <i>Collaboration with: John Hopkins University</i> <ul style="list-style-type: none">Developed a GPU-accelerated parallel algorithm for Open-Qmin using CUDA, achieving a 10x speedup to enable scalable simulations for active nematic systems. Optimized workflows to support deep learning model training, leveraging GPUs for high-performance computing in active matter physics. | 2023 – Present |
| Machine Learning Structure-Dynamics Correlation in Supercooled Liquids <i>PhD Research</i> <ul style="list-style-type: none">Implemented transformer-based neural networks and a suite of traditional machine learning models in PyTorch to uncover correlations in supercooled liquids through the processing of large-scale datasets with optimized C-Python pipelines. | 2020 – 2025 |
| Transfer Learning for Predictive Modeling of Supercooled Liquid Dynamics <i>Emory University</i> <ul style="list-style-type: none">Designed a transfer learning framework grounded in first principles to predict low-temperature dynamics from high-temperature structures in supercooled liquids using Support Vector Classification from Scikit-Learn. Resulted in a publication in Physical Review Research (2023), demonstrating advanced expertise in addressing complex physics challenges through innovative computational methods and interdisciplinary approaches. | 2022 – 2023 |
| Statistical Modeling of Material Failure in Disordered Systems <i>Emory University</i> <ul style="list-style-type: none">Created an optimized statistical model to predict material failure origins from large-scale datasets of disordered physical systems, leveraging Python and SciPy for efficient data processing. Presented findings to over 35 attendees at the American Physical Society March Meeting (2024), showcasing advanced data-driven problem-solving. | 2024 – 2025 |

Other Experience

- Physics Department, Creighton University** Aug 2017 – May 2019
Graduate Research Assistant Omaha, Nebraska
- Conducted statistical analysis of nanoparticle energy gap data using photoluminescence and Photon Correlation Spectroscopy, identifying key patterns in size variation to advance material property insight. Controlled workflow through LabView.
- Dooke Innovation Center** April 2017 – July 2017
Facility Manager Lagos, Nigeria
- Led interdisciplinary teams to implement technical solutions, fostering collaboration and delivering innovative workflows for facility management.
- DaviKhronus Limited** June 2015 – April 2016
Product Development Engineer Lagos, Nigeria
- Developed a laundry detergent product by optimizing chemical formulations and ensuring quality compliance through data-driven analysis, achieving 10% improved cleaning efficacy, showcasing analytical and innovative problem-solving.

Leadership Experience

- InterVarsity International Fellowship, Emory University** Aug 2022 – May 2025
President Atlanta, Georgia
- Fostered a collaborative environment for international students to connect, grow, and learn about each other's culture with the aim of building genuine and strong community.
- National Youth Service Corp, Environmental Sanitation Group** May 2016 – April 2017
President Delta, Nigeria
- Developed and implemented sanitation public sanitation programs like public market clean-up, awareness programs on compact of recycling etc. in the Umutu rural community.
- Physics and Engineering Physics Student's Association, OAU** June 2012 – June 2014
Vice President Osun, Nigeria
- Organized academic and professional development programs, enhancing student engagement and learning outcomes.

Publications & Conferences

- Tomilola Obadiya** and Daniel Sussman; Physical interpretability of machine learning methods: learning energy barriers from local structures in supercooled fluids; Talk; *American Physical Society March Meeting* (2024), Minneapolis, Minnesota.
- Tomilola Obadiya** and Daniel Sussman; Does fluid structure encode predictions of glassy dynamics?; Talk; *American Physical Society March Meeting* (2023), Las Vegas, Nevada.
- Obadiya, T. M.**, & Sussman, D. M. (2023). Using fluid structures to encode predictions of glassy dynamics. *Physical Review Research*, 5(4), 043112.
- Obadiya, T.**, Uppala, H., & Sidebottom, D. (2019). Fluorescent Carbon Particles formed from Concentrated Glucose Solutions. *MRS Advances*, 4(2), 67-72.
- Tomilola Obadiya** and David Sidebottom; Fluorescent Particles Formed from Concentrated Glucose Solution; Poster; *MRS Fall meeting and exhibit* (2019), Boston, Massachusetts.

Honors & Awards

- The Excellence in Graduate Research Award (2024); Physics Department, Emory University
- Laney Graduate School Fellowship (LGSF), Emory University (2019)
- Professor A.F. Oluwole Prize for the best graduating student with the Highest GPA in B.Sc. Engineering Physics Program (2015, OAU)