



Nick Lauersdorf

Computational Physicist
and Data Scientist

- Alpharetta, GA
- (608) 852-6337
- <https://www.njlauersdorf.com>
- njlauersdorf@gmail.com

Social Network

- ResearchGate Profile
- Github Profile
- LinkedIn Profile

Languages

	Python	● ● ● ● ●
	BASH	● ● ● ● ●
	MATLAB	● ● ● ● ●
	C++	● ● ● ● ●
	HTML	● ● ● ● ●
	CSS	● ● ● ● ●
	Javascript	● ● ● ● ●
	SQL	● ● ● ● ●

Tools

	HOOMD-Blue	● ● ● ● ●
	Microsoft Office	● ● ● ● ●
	Numpy	● ● ● ● ●
	SciPy	● ● ● ● ●
	Matplotlib	● ● ● ● ●
	Mathematica	● ● ● ● ●
	Model Development	● ● ● ● ●
	Tableau	● ● ● ● ●
	Scikit-learn	● ● ● ● ●
	Seaborn	● ● ● ● ●
	OpenCV	● ● ● ● ●
	Pytorch	● ● ● ● ●
	Tensorflow	● ● ● ● ●
	Django	● ● ● ● ●

Objective

Computational Physicist seeking to apply 9-years of modeling and simulation, data science, and software development experience to a career in industry. Extensive experience developing physics-based models, writing algorithms to statistically analyze big data, and designing intuitive visualizations to share significant findings.

Education

- PhD in Materials Science** | UNC-Chapel Hill 2019 – Spring 2024
 - Graduate business certificate in Innovation, Leadership, & Management
 - Fully paid for 3-years of graduate career by winning the Department of Defense (DoD) National Defense Science & Engineering Graduate (NDSEG) Fellowship
- B.S. in Physics and Mathematics** | UW-Madison 2014 – 2018
 - GPA: 3.60

Experience

Research & Programming

- Computational Physicist** | UNC-Chapel Hill 2020 – current
 - Discovered meta-stable states of phase separation (clustering) for active Brownian particle mixtures via C++ molecular dynamics simulations [1]
 - Determined phase boundary between stable and meta-stable clusters by training logistic regression machine learning model [2]
 - Allowed differentiation of bulk and interface of cluster by writing local translational and orientational order-based clustering algorithm
 - Enabled design of non-equilibrium steady-states by deriving predictive statistical mechanics theory [4]

- Data Scientist** | BeAM Makerspaces 2019 – 2021
 - Enabled cost-efficient scheduling and targeted marketing by developing Tableau workbooks for statistical analysis of makerspace user demographics
 - Improved end-user experience of staff by leading beta testing of user analytics software
 - Increased monthly first-time users by 15% by designing marketing visualizations for UNC's websites and within every UNC makerspace
 - Led team that created and implemented a campus-wide inventory tracking system and database

- Experimental Physicist** | UNC-Chapel Hill 2019 – 2020
 - Expanded lab's presence by forming and managing a collaboration network with numerous national labs
 - Enabled detection of harmful materials by developing first narrow-band perovskite photodetector for photo-luminescence measurements [5]
 - Taught photodetectors to developing scientists by publishing textbook chapter [3]

- Assistant Scientist** | Pharmaceutical Product Development 2018 – 2019
 - Increased customer satisfaction by writing FDA-regulated reports

- Computational Physicist** | UW-Madison 2015 – 2018
 - Enabled accurate prediction of fusion plasma properties by developing a Bayesian statistics model in Python
 - Increased efficiency of model by 40% through converting iterations over lists to multi-dimensional tensor mathematics
 - Enabled user-friendly design of x-ray detector optics by developing multi-variable optimization routines to maximize signal
 - Increased measurement capabilities of scientists by designing x-ray detector that removes undesirable noise from measurements [6]

Teaching & Mentoring

- Mentor** | Junior Science & Humanities Symposium (JSHS) 2022 – current
 - Accomplished machine learning, computer vision, and data science research projects by mentoring high school students
 - Earned \$8,000 for two mentees' college funds by placing second at JSHS nationals
 - Competed at finals for International Science & Engineering Fair (largest pre-college STEM competition in world)

Nick Lauersdorf

Computational Physicist
and Data Scientist

Operating Systems —

macOS	MacOS	● ● ● ● ●
Linux	Linux	● ● ● ● ●
Microsoft Windows	Microsoft Windows	● ● ● ● ●

Interests —

Video Games	● ● ● ● ●
Comic Collecting	● ● ● ● ●
Film	● ● ● ● ●

Certificates —

- UNC graduate business certificate in Innovation, Leadership, & Management
- Department of Defense certificate in Machine Learning for Everyone

Memberships —

- American Physical Society — 2016 – current
- Materials Research Society — 2019 – current
- Graduate Student Government — 2020 – 2021
- Graduate Student Association — 2021 – current

Teaching Assistant | UNC-Chapel Hill

2020 – 2021

- Introduced others to programming by leading lectures on MATLAB and Python
- Designed molecular dynamics models by overseeing semester-long research projects

Service & Outreach

Founder | Graduate Student Association

2021 – current

- Connected graduate students during pandemic by planning social events
- Advocated for student rights by co-developing department curriculum
- Empowered students by organizing career development talks with established PhD professionals

Senator | Graduate Student Government

2020 – 2021

- Elected by peers to serve on senate and finance committee
- Provided financial support to minority-serving outreach organizations and remote students during pandemic by writing and arguing for bills

Publications

- Lauersdorf, N.**, et al. Activity-based Segregation in Binary Active Mixtures. (In Preparation)
- Lauersdorf, N.**, et al. Programmable Binary Active Mixtures. (In Preparation)
- Lauersdorf, N.**, et al. Perovskites Enabled Highly Sensitive and Fast Photodetectors. *Perovskite Photovoltaics and Optoelectronics: From Fundamentals to Advanced Applications* 383-409, edited by Tsutomu Miyasaka (2022).
- Lauersdorf, N.**, et al. Phase behavior and surface tension of soft active Brownian particles. *Soft Matter* 17, 6337-6351 (2021).
- Wolanyk, J., Xiao, X., Fralaide, M., **Lauersdorf, N.**, et al. Tunable perovskite-based photodetectors in optical sensing. *Actuators, B Chem.* 320, 128462 (2020).
- Lauersdorf, N.**, et al. Development of a Ross Filter Based Aluminum Line Radiation (NickAl2) Detector in Madison Symmetric Torus. *Internally published by UW-Madison.* (2018).

Presentations

I have **presented at 25 conferences and seminars**, including six national conferences.

- Programmable Binary Active Mixtures. **Oral and poster presentation** at the *4th Annual NDSEG Fellows Conference* (Aug. 2023)
- Programmable Binary Active Mixtures. **Oral presentation** at the *American Physical Society March Meeting* (Mar. 2023)
- Surface Tension of Soft Active Brownian Particles. **Oral presentation** at the *American Physical Society March Meeting* (Mar. 2022)
- Phase Behavior and Surface Tension of Soft Binary Active Brownian Particles. **Poster presentation** at the *Triangle Student Research Competition* (Oct. 2021) — **Awarded 1st place from over 100 contestants**
- Thin Single Crystal Perovskites for Unprecedented Low Noise and Large Linear Dynamic Range Photodetectors. **Poster presentation** at the *Consortium for Enabling Technologies and Innovation Workshop* (Nov. 2019)
- Development of a Ross Filter-based Aluminum Line Radiation Detector (NickAl2) for MST. **Poster presentation** at the *American Physical Society Division of Plasma Physics Annual Meeting* (Nov. 2018)
- ROSS Filter Development for Absolute Measurement of Al Line Radiation in MST. **Poster presentation** at the *American Physical Society Division of Plasma Physics Annual Meeting* (Oct. 2017)

Awards

- NDSEG Research Fellowship [\$165,000]** | Department of Defense 2021 – 2024
- First Place Presentation** | Triangle Student Research Competition 2021
- Theodore Herfurth Scholarship [\$40,000]** | UW-Madison 2014 – 2018