James T. Glazar

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Education

University of Pennsylvania, Philadelphia, PA — Expected Graduation: Spring 2024

Ph.D., Materials Science and Engineering, GPA: 3.59
Funding: National Defense Science and Engineering Graduate Fellowship ($300,000 / 3 years)
Advisor: Prof. Vivek B. Shenoy
Coursework: Big Data Analytics, Applied Bayesian Statistical Analysis, Statistical Mechanics, Thermodynamics

Stony Brook University, Stony Brook, NY — August 2015 - May 2019

B.S., Honors College, *summa cum laude*, GPA: 3.99
Majors: Applied Mathematics and Statistics, Physics
Semester Abroad: Munich University of Applied Sciences, Germany, Spring 2017
Coursework: Mathematical Statistics, Computational Physics, Finite Mathematical Structures, Operations Research

Test Scores: GRE Verbal 163/170, Quant 165/170, Writing 4.0/6.0; SAT Reading 690/800, Math 800/800, Writing 770/800

Research and Professional Experience

University of Pennsylvania, Philadelphia, PA — June 2019 - Present
PhD Candidate

- **Dissertation**: Developing physics-based simulations to study chromatin conformations in human cells at high resolutions incorporating experimental data from collaborators at Penn Medicine
- Analyzed software performance using gprof and optimized C++ simulation methodology to speed up performance over 10x while trimming over 400 lines of code
- Trained 2 new users on processor architecture, computer cluster job management, and administrating software libraries
- Developed Random Forest machine learning pipeline to identify piezoelectric and topologically nontrivial materials starting from a materials database with just a few dozen materials, discovering a new class of materials with 2x better properties
- Collaborated with Drexel University experimental group to investigate the electronic structure of novel 2D MXene alloys by performing density functional theory calculations to uncover trends in alloy conductivity and electron affinity

University of Pennsylvania, Philadelphia, PA — May 2021- May 2022
PCI Tech Transfer Fellow

- Parsed 3000+ publications and patents in online databases to prepare 13 Invention Assessment reports on prior art in medicine, materials engineering, and machine learning with less than 1 week turnaround time per report
- Communicated value of new intellectual property by writing 13 Marketing Assessments using common language to advertise Penn-developed technologies to potential partners and licensees at scientific research companies
- Worked under 5 Technology Licensing Officers at the Penn Center for Innovation and completed each report within deadline

Stony Brook University, Stony Brook, NY, *Profs. Marivi Fernandez-Serra and Matthew Reuter* — March 2018 – May 2019
Research Assistant

- Developed a novel graph-based metric to identify low and high density phases of water by quantifying symmetry-breaking in molecular dynamics simulations of phase transformations using Python data analysis tools
- Automated parallel molecular dynamics simulations of water on a computing cluster to search for the water-ice phase boundary using bash scripting tools
- Shared research findings in a written thesis and presented a poster at the Honors College colloquium in May 2019

Munich University of Applied Sciences, Munich, Germany, *Prof. Alfred Kersch* — March 2017 – August 2017
International Research Assistant

- Collaborated with a small team of German and Czech researchers to simulate hafnium-oxide ferroelectric materials using the LAMMPS molecular dynamics simulation package
- Optimized energetic and dynamical simulation parameters to determine equilibrium conditions and calculated heat capacity, electronic conductivity, and thermal conductivity to evaluate thermal stability

Stony Brook University, Stony Brook, NY, *Prof. Marivi Fernandez-Serra* — June 2016 – August 2016
Research Assistant

- Analyzed energetic data from a new density functional theory method to determine the method's accuracy, efficiency, and precision for over 50 solid state elemental phases

Publications and Presentations

- J. Glazar and V. Shenoy, Multi-scale simulations to assess chromatin organization along the nuclear periphery, Contributed talk at American Physical Society Spring 2023 Meeting, Las Vegas, NV (2023)
- J. Glazar and V. Shenoy, Data-driven design of soft sensors, *Nature Machine Intelligence* (2022)
- M. Han et al., Tailoring electronic and optical properties of MXenes through forming solid solutions, *Journal of the American Chemical Society* (2020)
- J. Glazar and M. V. Fernandez-Serra, Identifying two phases of liquid water using symmetry, Honors College Symposium, Stony Brook University, Stony Brook, NY (2019)

Activities

University of Pennsylvania, Philadelphia, PA July 2020 – August 2020
Teaching Assistant: Atomistic Methods in Materials Science

- Taught 15 graduate students the theory and practice of statistical physics, Monte Carlo methods, and molecular dynamics simulations during weekly recitations
- Provided tailored one-on-one instruction with 4 students to improve fundamental physical and mathematical understanding, troubleshoot programmed simulations in Python and MATLAB, and analyze, plot, and interpret results

University of Pennsylvania, Philadelphia, PA September 2019 – March 2020
Science Outreach Volunteer

- Created mathematical visualizations in Mathematica to assist instruction weekly at 2 historically underserved high schools in West Philadelphia, explaining problem setups and patterns in linear algebra and calculus
- Coached over 20 elementary school students from historically disadvantaged districts in West Philadelphia through engaging team-based challenges involving mechanics, engineering, and creative problem-solving

Stony Brook University, Stony Brook, NY September 2018 - May 2019
Residential Tutor: Physics I/II, Calculus I/II, Introduction to Probability

- Quickly assessed student aptitude and tailored instruction to efficiently teach basic physics concepts to over 100 students
- Completed College Reading and Learning Association Level 1 training to refine practical tutoring and science communication skills, including question-asking strategies, goal setting and planning, and time management
- Built relationships with frequent tutoring center attendees by setting achievable goals, offering encouragement, and developing more robust learning and study habits
- Led group study sessions in a dynamic, fast-paced collaborative space involving up to 10 tutors and students

Stony Brook University, Stony Brook, NY September 2018 – May 2019
Physics Help Room Volunteer

- Developed physics visualization, intuition, and problem-solving skills in struggling undergraduate students via self-paced one-on-one tutoring sessions lasting up to 3 hours
- Taught students how to derive and apply proper error analysis for undergraduate physics laboratory experiments
- Refereed 2 middle school Science Olympiad competitions involving robotics, mechanics, physics, and engineering
- Planned and operated an engaging physics demonstration teaching heat engine efficiency at a local high school science fair, teaching over 30 elementary- through high-school students basic thermodynamic concepts

NYC It All, Stony Brook University November 2015 – May 2019
President and Founder

- Planned, marketed, organized, and led trips to New York City involving up to 100+ students in collaboration with Stony Brook University, the Long Island Rail Road, and organizations in New York City
- Designed and maintained IT infrastructure for club membership and email communication systems
- Delegated outreach, design, and financial tasks to appropriate executive board members and created clear timelines
- Engaged the campus community with flyers, meetings, and word-of-mouth to grow membership to over 300 students
- Volunteered as welcome ambassador for new out-of-state and international students, helping students navigate campus and acclimate to life at Stony Brook

Selected Awards

- National Defense Science and Engineering Graduate Fellowship, Department of Defense August 2021 - Present
- Academic Excellence Travel Scholarship, Munich University of Applied Sciences February 2017
- Provostial Scholarship, Stony Brook University August 2015 – May 2019
- Valedictorian Scholarship, Stony Brook University August 2015 – May 2019
- Eagle Scout, Boy Scouts of America April 2014