Will Lancer

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Education

Stony Brook University — Aug. 2023 – May 2026 (expected)
B.Sc. in Physics and Mathematics — *Stony Brook, NY*

- **GPA:** 3.96 Overall, 3.99 Physics

Experience

Undergraduate Reading Course and Research — Sept. 2025 – Present
Stony Brook University — *Stony Brook, NY*

- Project: Aharonov–Bohm physics in metals and its links to anomalies in defect couplings and 1+1D gapless systems (advisor: Zohar Komargodski).
- Reading course in many-body quantum mechanics and condensed matter physics
- Readings in quantum field theory and related topics to further prepare for future quantum field theory research

Undergraduate ATLAS Researcher — Jan. 2025 – Present
Stony Brook University — *Stony Brook, NY*

- Analysis focus: $t\bar{t}H$ with $H \to c\bar{c}$ (advisor: Hannah Arnold). Implemented charm-tagging preselection and event filters in ROOT/C++; validated MC samples.
- Analyzed kinematical data using C++ and machine-learning techniques; produced new selection method for charm quark jets; familiar with SALT flavor tagging.
- Ran batch jobs on large datasets; organized outputs and version-controlled analysis code for reproducibility.

Undergraduate Reading Course — Oct. 2024 – Present
Stony Brook University — *Stony Brook, NY*

- Studied Georgi's *Lie Algebras in Particle Physics* under Martin Roček: weekly problem sets/discussions on representations, Lie groups, and Lie algebras
- Audited PHY 610 (QFT I) under Alexander Zamolodchikov through reading course; studied path integrals, effective actions, RG flows, Wilson-Fisher fixed points, etc.

Coursework & Extracurriculars

Relevant Coursework

- **Graduate Physics:** Classical Mechanics (PHY 501; A); Classical Electrodynamics (PHY 505; A); Quantum Field Theory II (PHY 611; A); Group Theory for Theoretical Physics (PHY 680; A), Topology in Many-Body Physics and Quantum Field Theory (PHY 680), Advanced Statistical Mechanics (PHY 541)
- **Mathematics:** Commutative Algebra and Algebraic Geometry (MAT 487); Real and Complex Analysis; Abstract Algebra; PDEs; proof-based Linear Algebra
- **Undergraduate Physics:** Modern Physics; Waves & Optics; Electromagnetism I; Quantum Mechanics I; Statistical Mechanics; Scientific Computing; Electronics and Instrumentation Laboratory
- **Teaching Assistance:** Teaching Assistant for PHY 306 (Statistical Mechanics and Thermodynamics)

Extracurriculars

- Society of Physics Students — Writer of the "Problem of the Week"; regular attendee of talks and meetings
- Stony Brook Math Club — Weekly problem-solving sessions and seminars
- Wrestling Club; Brazilian Jiu-Jitsu Club — Regular practitioner
- Undergraduate Mathematics Representative — Helped preserve the Math & Physics Library at SBU

Technical Skills and Awards

Programming Languages and Frameworks: C++, Python (PyTorch), ROOT; basic Java and Fortran
Tools: Git, LaTeX, Monte Carlo workflows, ROOT-based data wrangling/plotting
Awards: Dean's List (every semester); Presidential Scholarship; Sigma Pi Sigma (only sophomore inductee); URECA Summer Fellowship ($6k); URECA Researcher of the Month (Oct. 2025), **Goldwater Nominee**