

Luke M. Stewart

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EDUCATION

Massachusetts Institute of Technology (MIT)

Candidate for Bachelor of Science in Physics - GPA 4.9/5.0

Coursework includes: Quantum Physics, Statistical Physics, Nonlinear Dynamics, Vibrations & Waves

Cambridge, MA

June 2022

New Canaan High School

GPA: 100.1/95.4 (weighted/unweighted)

ACT: 35 SAT Subject Tests: 800 - Physics, 780 - Math Level II

National AP Scholar with Distinction: Courses include AP Physics C, AP Chemistry, AP Biology, AP Calculus

New Canaan, CT

June 2018

RESEARCH EXPERIENCE

MIT - Comin Photon Scattering Lab

Research Intern

Cambridge, MA

June 2020 - Present

- Exploring the 2D superconducting (SC) transition dynamics in thin-film cuprate HTS exfoliations
 - Leveraging Raman spectroscopy to observe joint SC & charge, spin density wave (CDW/SDW) orders
 - Applying spectral methods to numerically solve the 2D TDGL equations & model a defect-driven vortex lattice
 - Facilitating nanofabrication process collaboration with Kim group (Harvard)

MIT Plasma Science and Fusion Center - SPARC HTS R&D

Research Intern

Cambridge, MA

Fall 2018 - Present

- Characterizing propagation of uncertainty in high-temperature superconductor critical performance
 - Developing Monte Carlo techniques for probabilistic analysis of quality-assurance & manufacturing processes
 - Building an efficient convex optimization solver to analyze current sharing & distribution in the magnets
- Produced an interpolation regime for HTS tape data including nonlinear analytical and numerical techniques
 - Incorporated back-end automation & noise reduction into updated GUI for use in SPARC device design
- Built structural optimization models for high-field toroidal electromagnets
 - Produced optimal engineering designs of superconductor support structures and overall magnet contour
 - Made regular design presentations to the SPARC Structures group
- Designed a full-scale statistical quality assurance protocol for HTS magnet construction

Bermuda Institute of Ocean Sciences

Research Intern

Bermuda

Summer 2015 - 2018

- Applied DNA metabarcoding of 18S rRNA to analyze ecological trends in holoplanktonic mollusks
 - Presented results at the 2018 ASLO Ocean Sciences Meeting, Portland, Oregon

Harbor Watch

Research Intern

Westport, CT

2015 - 2018

- Analyzed water quality and nutrient data to assess the health of the Long Island Sound watershed
 - Co-author: *Assessing the Resiliency of Salt Marshes under Increasing Nitrogen Loading* (in review for publication)

ACADEMIC AWARDS

- New Canaan High School Scholar Leader Award, Outstanding Student in Science, Departmental Award in Mathematics, Departmental Award in Biology, Award for Intellectual Curiosity in the Study of Science

EXTRACURRICULAR

MIT EnergyHack

Director of Corporate Relations

August 2019 - November 2019

MIT Varsity Swim & Dive Team

USA Swimming Scholastic All-American (2016-2017)

September 2018 - September 2019

SKILLS & INTERESTS

Software: Python, PyQt, MATLAB, COMSOL Multiphysics, ImageJ, Microsoft Office

MIT Energy Club, Scuba Diving (Advanced Open Water Certification - Navigation, Search & Recovery), El Greco