

Isaac Sherwood

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Education

University of Maryland (UMD)

B.S. Physics

College Park, MD

Graduation May 2027

Honors and Awards

Sigma Pi Sigma inductee

Dean's List

April 2026

Fall 2025–Present

Professional Experience

Summer Student Theoretical Physics Research Session Dept. of Physics,

Undergraduate Researcher

June 2026–Present

- Studying theoretical physics with a focus in supersymmetric theories and the underlying mathematical structures, including Lie groups and algebras, Clifford algebras, and differential geometry, mentored by Professor Sylvester James Gates Jr.
- Conducting research on supersymmetric theories projected onto lower dimensional coordinate systems.

Joint Quantum Institute, Dept. of Physics, UMD

Research Assistant

September 2025–Present

- Investigating the effects of nanopatterning on the behavior of superconducting materials in Professor Mohammad Hafezi's lab.
- Fabrication and characterization of nanoscale devices using electron beam lithography, scanning electron microscopy, reactive ion etching, and low temperature measurements.

Quantum Materials Center, Dept. of Materials Science and Engineering, UMD

Research Assistant

August 2024–Present

- Experimental research in superconductors and topological materials, focusing on device fabrication and quantum transport phenomena, in Professor Ichiro Takeuchi's lab.
- Fabricating spin injection devices using photolithography, ion beam etching, and other fabrication techniques; performing low temperature measurements.

Blue Wave Semiconductors, Inc.

Technical Intern

Jun 2023–Jan 2024

High School Apprentice

Oct 2022–Jun 2023

- Led research in developing new techniques for fusion and eutectic bonding of semiconductor and insulating materials.
- Assisted in construction, operation, and maintenance of ultra-high vacuum and thin film deposition systems for research and industrial fabrication including thermal evaporators, pulsed laser deposition, sputtering, and chemical vapor deposition systems.
- Worked on a team to write project proposals and conduct background research for potential research projects and business partnerships.

Department of Physics Summer Programs, UMD

Summer Camp Counselor

June 2026–July 2026

- Summer camp counselor for The Amazing Science Discovery Camp and Advanced Physics Summer Program at UMD.
- Led group activities, presented demonstrations, taught lessons to students between the 3rd and 12th grades.

Department of Physics, UMD

Teaching Assistant for Modern Physics

January 2026–Present

- Teaching assistant for Modern Physics, an upper-level degree requirement for physics majors covering early quantum mechanics, thermodynamics, and special relativity.
- Holding group problem solving sessions, proctoring exams, grading exams and homework assignments, answering student questions and providing academic support.

Society of Physics Students, UMD Chapter

Paid Physics Tutor

January 2025–Present

Volunteer Physics Tutor

September 2024–December 2024

- Paid tutor tutoring undergraduate physics and engineering majors in introductory mechanics, electricity and magnetism, and upper-level physics courses.

College of Information Science, UMD

Archival Research Secretary

February 2024–August 2024

- Worked with members of the Piscataway Conoy Tribe and university archivists to locate culturally significant images, documents, and artifacts for use in an upcoming book and the tribe's ongoing education projects, ensuring proper copyright permissions.

Leadership and Volunteer Experience

Society of Physics Students, UMD Chapter

President

June 2026–Present

Outreach Coordinator

June 2025–June 2026

Member

September 2023–Present

- Organized a public lecture series focused on ongoing physics research and career development featuring 10+ faculty speakers.
- Planning physics demonstration shows, recruitment events, fundraisers, weekly meetings, resume workshops, career development workshops, and social gatherings for undergraduate physics majors at UMD.
- Worked on an organizing committee to plan and run the 2025 Society of Physics Students Zone 4 Meeting, including student talks and presentations, a poster session, and lab tours.

Physics Department Outreach, UMD

Outreach Presenter

September 2024–Present

- Planning and running outreach events at the UMD Physics Department for elementary, middle, and high schoolers, as well as the general public.
- Involved with over 20 outreach events, including Physics is Phun, Discovery Days, Maryland Day, local high school visits, and other educational science programs for the community.

QURISE Local Organizing Committee, Department of Physics, UMD

Conference Organizer

December 2025–January 2026

- Planned and organized events and lab tours for 60+ attendees at a quantum research conference hosted at UMD.

Engineers Without Borders, UMD Chapter

Treasurer

May 2024–June 2025

Structures Team Member

September 2023–June 2025

- Managed all money and resources for the university-wide organization chapter.
- Designed and implemented sanitation and water facilities for St. Anne Grace School in Nakifuma, Uganda and a health clinic in Guatemala with a focus in structural design.

Technical Skills

Mathematics:

- Algebra: linear algebra; groups, rings, fields, Galois theory; Lie groups and Lie algebras
- Calculus; multivariable calculus, ordinary and partial differential equations
- Python programming

Nanofabrication and characterization:

- Electron-beam lithography, maskless photolithography
- Wet chemical etching, reactive ion etching, ion beam etching

- Scanning electron microscopy, atomic force microscopy
- Low temperature superconductivity measurements

Thin film deposition and vacuum systems:

- Ultra-high vacuum system construction, repair, and maintenance
- Sputtering, thermal evaporation, electron beam evaporation
- Chemical vapor deposition

Other Skills:

- Writing grant proposals, technical articles
- Typesetting in Latex
- CAD: Autodesk Fusion 360, AutoCAD, KLayout

Coursework

University of Maryland

September 2023–Present

- **Physics Coursework:**
 - Quantum Physics I
 - Quantum Physics II
 - Statistical Thermodynamics
 - Particle Astrophysics
 - Modern Physics
 - Intermediate Electricity and Magnetism
 - Python Programming
- **Mathematics Coursework:**
 - Introduction to Abstract Algebra
 - Theoretical Linear Algebra
 - Fields and Galois Theory
 - Non-Euclidean Geometry
 - Mathematical Proof
- **Other relevant coursework:**
 - Nuclear Reactor Design
 - Nuclear Reactor Systems and Safety
 - Technical Writing
 - Teaching STEM

Rangjung Yeshe Institute, Kathmandu University

June 2025–August 2025

- Buddhist Studies Summer Intensive Program: Formal study of Buddhist philosophy and history on campus at Ka Nying Shedrub Ling Monastery with a focus on Tibetan Buddhism