James Clifford

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https://jclifford9.github.io/Website/

Education

M.A. Physics — expected May 2024
B.A. Physics, Mathematics — May 2023
Minor in Materials Science and Engineering — May 2023
Wesleyan University, Middletown, CT
Unweighted GPA: 3.98/4.00

Research Experience

Molecular Collisions Laboratory — February 2022 - Present
Wesleyan University
Mentored by Dr. Brian Stewart

- Undertook a critical study of our group's experimental and data analysis procedures that involved thermally stabilizing our laser and proposing new methods to reduce noise and uncertainty in our data
- Collected data via classical trajectory simulations on both model and *ab initio* potential energy surfaces to design a series of benchmark experiments in the study of vibrational energy transfer
- Learned Gaussian 16 in order to create *ab initio* potential energy surfaces that model the Li_2-rare gas collisional systems that our group experimentally studies
- Delivered a talk and presented a poster about my preliminary work at the *Wesleyan University Undergraduate Summer Research Poster Session* (July 2023)

Nuclear Structure and Nuclear Astrophysics Group — May 2022 - August 2022
Oak Ridge National Laboratory
Mentored by Dr. Jason Nattress and Dr. Michael Febbraro

- Drafted and conducted a literature search for a paper regarding the optical transparency of graphene in the vacuum ultraviolet (VUV) regime (paper unpublished)
- Designed a workflow for the robotic assembly of 3D-printed scintillation detectors
- Calibrated and prepared stilbene radiation detectors for use in experiments at the Institute for Structure and Nuclear Astrophysics (ISNAP) at the University of Notre Dame

Wave Transport in Complex Systems Laboratory — February 2021 - July 2021
Wesleyan University
Mentored by Dr. Tsampikos Kottos and Dr. Rodion Kononchuk

- Computationally studied Wigner's cusp anomalies in multimode systems for the development of hyper-sensitive, nonlinear sensing technologies
- Formally presented this work at the *Wesleyan University Undergraduate Summer Research Poster Session* (July 2021)

Relevant Coursework

Physics: Waves and Oscillations, Classical Mechanics, Electricity & Magnetism, Electronics Lab, Statistical and Thermal Physics, Quantum Mechanics (I and II), Nonlinear Dynamics and Chaos, Analytical Mechanics, Mathematical Physics (Spring 2024)

Mathematics: Multivariable Calculus, Differential Equations, Linear Algebra, Abstract Algebra, Probability, Mathematical Statistics, Real Analysis

Materials Science and Engineering: Mechanical Design and Enginnering, Electrical Design and Engineering, Mechanics and Materials

Teaching Experience

General Physics I Course Assistant	September 2020 - December 2020
General Physics II Tutor	January 2021 - May 2021
General Physics II Laboratory Teaching Assistant	January 2021 - May 2021
Classical Mechanics Tutor	January 2023 - May 2023

Programming and Software

- Programming languages: Arduino, Bash, C, Python
- Software: Adobe After Effects, Adobe Illustrator, Adobe Photoshop, Gaussian 16, Gnuplot, LaTeX, Mathematica, SolidWorks

Awards and Honors

Wesleyan University Dean's List (eight semesters)	2019 - 2023
Phi Beta Kappa National Honor Society	2023
Wesleyan University Van Dyke Prize (Physics)	2023

Extracurricular Activities

Baseball 2019 - Present

- Starting catcher for the Wesleyan University varsity baseball team
- Team captain August 2022 - Present

Student Athletic Advisory Committee (SAAC) August 2022 - Present

- SAAC is formed from two leaders of each varsity athletic team on campus and consults with Wesleyan's athletic department and administration regarding NCAA legislation
- SAAC also collaborates with other resources on campus, such as the center for counseling and psychological services (CAPS) and the office for equity and inclusion, to help student-athletes along their college experience
- Member of the committee on mental health

Student Athlete Support Network (SASN) September 2019 - Present

- SASN forms peer mental health advocates in collaboration with CAPS
- SASN trains student-athletes to help others in challenging situations such as those suffering from anxiety or depression, eating disorders, suicidal thoughts, and more

Miracle League Baseball August 2019 - March 2020

- The Miracle League brings the joys of athletic competition and being part of a team to children with disabilities and special needs