TANNER S. JACKSON

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EDUCATION

University of Kentucky | Lexington, KY *Expected May 2029*
Ph.D. Student
Physics
Advisor: Alexey Milekhin
- Cumulative GPA: 3.91/4.00

Indiana University | Richmond, IN *Expected May 2026*
Bachelor of Science
Mathematics
- Cumulative GPA: 4.00/4.00

DePauw University | Greencastle, IN *May 2024*
Bachelor of Arts
Major in Physics, Minors in Japanese Language and Media Studies
Advisor: Avery Archer
Science Research Fellow
Media Fellow
- Cumulative GPA: 3.94/4.00

Waseda University | Tokyo, Japan *April 2023 – July 2023*
Off-Campus Study
- Achieved conversational fluency in Japanese through courses offered at the university and by living with a Japanese host family in Tokyo

RESEARCH EXPERIENCE

University of Kentucky | Lexington, KY *August 2025 – Present*
Researcher, Physics and Astronomy Department
Project: Pauli Instability in Finite Temperature Regime
Advisor: Alexey Milekhin
- Extended properties such as faithfulness, invariance, and T gate scaling of the Pauli instability magic monotone to the finite temperature domain

University of Kentucky | Lexington, KY *May 2025 – December 2025*
Researcher, Physics and Astronomy Department
Project: Algebraic Geometric Codes and the Varshamov-Gilbert Bound
Advisor: Anatoly Dymarsky
- Investigated algebraic geometric (AG) codes with particular emphasis on the Goppa code subclass, self-dual constructions, and their ability to outperform the Varshamov-Gilbert (VG) bound

DePauw University | Greencastle, IN *January 2023 – March 2023*
Undergraduate Researcher, Computer Science Department

Project: Using Machine Learning for Software-Defined Radios Classification
Advisor: Khadija Stewart

- Classified Software-Defined Radios (SDR)s using different supervised Machine Learning (ML) methods on the Radio-Frequency Distinct Native Attributes (RF-DNA) fingerprinting dataset I collected from my research during the summer of 2022
- Determined that the Light Gradient Boosted Machine Multiclass (LightGbmMulti) and Fast Tree classification algorithms performed the best, achieving over 84% accuracy in SDR classification

DePauw University | Greencastle, IN *August 2022 – December 2022*
Undergraduate Researcher, Physics and Astronomy Department
Project: Reflection of Skirting Droplets
Advisor: Jacob Hale

- Utilized a 3D-printed droplet-on-demand (DOD) generator and high-speed camera to analyze the behavior of droplets skirting across a fluid bath in the presence of boundaries
- Performed image analysis in ImageJ to measure the droplets' angles of incidence and reflection followed by developing a linear regression of the data in Python; observed a linear relationship between the droplets' angles but not one that completely agrees with the law of reflection

University of Tennessee at Chattanooga | Chattanooga, TN *May 2022 – July 2022*
Undergraduate Researcher, Electrical Engineering Department
Project: Evaluation of RF-DNA Fingerprinting Under Extreme Temperatures (NSF-REU)
Advisors: Donald Reising, Daniel Loveless

- Collected the signals from Commercial Off-The-Shelf (COTS) SDRs undergoing extreme temperatures that the RF-DNA fingerprints would be extracted from
- Created a user interface (UI) in MATLAB to perform Principal Component Analysis (PCA) and then k-means clustering on the RF-DNA fingerprinting data to assess SDR identification; the UI allowed for 60% faster clustering of the data than the previous code used
- Determined that k-means clustering did not accurately classify SDRs but that supervised ML methods potentially could

TEACHING EXPERIENCE

University of Kentucky | Lexington, KY *August 2024 – Present*
Teaching Assistant
E&M Lab Support (PHY213, PHY242)

- Conduct the weekly preparatory meetings for lab instructors teaching a course on electricity and magnetism
- Prepare the laboratories for each week's experiment and repair any broken lab equipment

University Physics Laboratory I (PHY241)

- Served as primary instructor of laboratory course focused on experiments in mechanics

University Physics Laboratory II (PHY 242)

- Served as primary instructor of laboratory course focused on experiments in electricity and magnetism

Introduction to Physics (PHY 151)

- Designed introductory physics problems for the course's exams and homework assignments

SKILLS

Programming
- Python, MATLAB, SageMath, R, Mathematica, Arduino

Research
- Qiskit, ML, PCA, 3D Modeling/Design, Image Frame Analysis, Technical Writing

Media
- Adobe Premiere Pro, LaTeX, Audacity/Audio Editing, Microsoft Office

PUBLICATIONS AND PRESENTATIONS

Jackson T. Understanding Goppa codes via algebraic geometry, University of Kentucky Physics Annual Poster Session; 2025 August 21; Lexington, Kentucky. https://drive.google.com/file/d/1Y_X9DL0C-2GgzGd8QjMWlkpFRRDijRyY/view?usp=sharing

C. S. Peggs, T. S. Jackson, A. N. Tittelbaugh, T. G. Olp, J. H. Tyler, D. R. Reising and T. D. Loveless, "Preamble-based RF-DNA Fingerprinting Under Varying Temperatures," 2023 12th Mediterranean Conference on Embedded Computing (MECO), Budva, Montenegro, 2023, pp. 1-8, doi: 10.1109/MECO58584.2023.10155035.

Jackson T. Boundary reflection of liquid droplets, DePauw Physics Experimental Methods Symposium; 2022 December 13; Greencastle, Indiana. https://docs.google.com/presentation/d/1SdcRERoOpv5dugKeY26k6u_20NX3zdpD/edit?usp=sharing&oui d=114291142696040895979&rtpof=true&sd=true

Jackson T, Peggs C. Extreme temperature effects on low cost software-defined radios and their radio-frequency distinct native attributes, UTChattSat REU Symposium; 2022 July 28; Chattanooga, Tennessee. https://docs.google.com/presentation/d/1z_eHvUSJA1Bv5cMEeLUxYstfUGTSJ2IVmqwF6F6_PSA/edit?u sp=sharing

HONORS AND AWARDS

Max Steckler Summer Research Fellowship, University of Kentucky, *2025*
Sigma Pi Sigma, DePauw University, *2024*
Chi Alpha Sigma, DePauw University, *2024*
NCAC Scholar-Athlete of the Year, DePauw University, *2024*
Science Research Fellow, DePauw University, *2022 – 2024*
Media Fellow, DePauw University, *2020 – 2024*
DePauw University Merit Award, *2020 – 2024*
Dean's List (GPA 3.5+/4.0), DePauw University, *2020 – 2024*
Tiger Pride Honor Roll (student-athlete GPA 3.4+/4.0), DePauw University, *2020 – 2024*
George E. Lortz Scholar Athlete Award, DePauw University, *2023*
Lambda Pi Eta, DePauw University, *2023*
William Darroch Scholarship, DePauw University, *2023*
Stringfellow Endowed Scholarship, DePauw University, *2023*
Ivan Allen Jr. Leadership Award, Sigma Alpha Epsilon, *2023*
Klauser Japanese Projects Award, DePauw University, *2023*
Gertrude and G.D. Crain Award, DePauw University, *2022*

PROFESSIONAL MEMBERSHIPS

American Mathematical Society (AMS) *December 2023 – Present*

National Society of Physics Students (SPS) *October 2023 – Present*

Institute of Electrical and Electronics Engineers (IEEE) *September 2023 – Present*

American Physical Society (APS) *January 2022 – Present*

LEADERSHIP AND SERVICE

University of Kentucky Physics Graduate Student Council | Lexington, KY *January 2025 – Present*
Secretary, Social Media and Communications Officer

- Schedule officer meetings and manage PGSC-related documents
- Supervised PGSC social media accounts and aided in organization of events for the physics graduate student body

DePauw Society of Physics Students | Greencastle, IN *October 2023 – May 2024*
President

- Organized physics-related events for members of DePauw's student body.

DePauw Student Athletic Advisory Committee | Greencastle, IN *August 2023 – May 2024*
Representative

- Communicated with leadership within the athletic department and other sports teams with the goal of strengthening team culture and increasing unity across DePauw athletics

West Central Indiana Regional Science and Engineering Fair | Greencastle, IN *March 2023*
Volunteer Judge

- Judged science projects created by middle school students from 11 counties and promoted a positive learning environment for the students

Sigma Alpha Epsilon | Greencastle, IN *October 2021 – May 2024*
Philanthropy Chair, Member

- Raised over $2,500 for the Travis Manion Foundation through a week of philanthropy events that I organized and supervised

DePauw University Dance Marathon | Greencastle, IN *October 2021 – May 2022*
Volunteer

- Raised money for the Riley Hospital for Children through DePauw's Dance Marathon organization, which contributes $65,000 yearly on average

DePauw Brazilian Jiu Jitsu Club | Greencastle, IN *August 2021 – May 2024*
Treasurer

- Produced the club's budget and purchase Gis, the uniform used in Brazilian Jiu Jitsu (BJJ), for new members; one of the original founders of the club

WGRE 91.5 FM | Greencastle, IN *October 2020 – December 2022*
Music Director, Assistant Production Director

- Managed and enhanced the music library of the radio station by utilizing audio recording and editing software and directed the station's overall sound towards my unique vision

Two-Sport NCAA Division III Varsity Student-Athlete | Greencastle, IN *August 2020 – May 2024*
- Men's Football Team
- Men's Track and Field

REFERENCES

Alexey Milekhin
University of Kentucky, Assistant Professor of Physics and Astronomy
milekhin@uky.edu

Howard Brooks
DePauw University, Senior Professor of Physics and Astronomy
(765)658-4653 | hlbrooks@depauw.edu

Donald Reising
University of Tennessee at Chattanooga, Professor of Electrical Engineering
(423)425-5843 | donald-reising@utc.edu

Avery Archer
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(765)658-4105 | averyarcher@depauw.edu

Khadija Stewart
DePauw University, Professor of Computer Science
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