Peter Jacobson

Durham, NC | peter.jacobson@duke.edu | peter.robert.jacobson@gmail.com | (770) 508-7661
in prjacobson | prjacobson | cern.ch/pejacobs

Education

Duke University — Durham, NC
PhD Candidate in Physics; in progress — *August 2022 - Present*

Berry College — Rome, GA
BS in Physics and Mathematics — *May 2022*
- Graduated *summa cum laude*

Research Experience

Spin entanglement in single top quark decays; *Duke University* — *May 2024 - Present*
Advisor: Ayana Arce
- Reconstructed simulated jets from ATLAS via TopCPToolkit (formerly AnalysisTop) to determine the degree of spin entanglement in decays of single top quarks
- Laid framework to study spin entanglement in decays from real ATLAS data

ATLAS ITk stave production; *Brookhaven National Lab & Duke University* — *May 2024 - March 2025*
Supervisor: Stefania Stucci
- Oversaw long-term endurance thermal cycling and electrical testing of barrel staves for use in the ATLAS inner tracker upgrade
- Developed scripts for summarizing testing results and comparing results over time

Entropy of a jet; *Duke University* — *Summer 2021; May 2023 - Present*
Advisor: Ayana Arce
- Analyzed simulated jets from ATLAS to measure how much information is attainable from a jet measurement at different resolutions
- Investigated the jet phenomenology to determine how best to calculate entropy and what it represents

Electrochemical liquid-liquid-solid growth of InGaAs; *Berry College* — *January 2021 - May 2022*
Advisor: Zachary Lindsey
- Developed new crucible design for growing crystalline $In_xGa_{x-1}As$ on a liquid gallium electrode
- Performed Raman and XRD analysis to determine effects of greater indium corporation

Magnetron sputtering of indium; *Berry College* — *October 2021 - December 2021*
Advisor: Zachary Lindsey
- Constructed a low-budget magnetron sputtering setup using custom 3D-printed components
- Investigated the effects of varying voltage and stage height on resistance and crystallite size

Other Experience

Introductory physics discussion leader; *Duke University* — *August 2023 - May 2024*
- Independently led weekly recitation sessions for introductory engineering physics courses, including guided tutorials and working of example problems
- Aided in the creation, administration, and following analysis of exams

Introductory physics lab TA; *Duke University* — *August 2022 - May 2023*
- Administered, graded, and aided in progress of introductory physics labs for undergraduates
- Graded exams for the introductory engineering physics course

Honors and Awards

2024	**ATLAS Center Grant**	US ATLAS Collaboration
May 2023	**Richardson Endowment Award**	Duke University
April 2022	**Lawrence E. McAllister Physics Award**	Berry College
May 2020	**Synovus Scholar**	Berry College

Coursework and Skills

Physics	Nuclear/Particle Physics, Advanced QM, Electrodynamics, Statistical Mechanics, Electroweak Interactions
Mathematics	Group Theory, Abstract Algebra, Knot Theory, Real Analysis
General skills	Linux, Python, Making aesthetically pleasing presentations, 3D printing and design, Hand tools, General IT, Getting hands dirty

Presentations

Stave 16 Problem Summary; *ATLAS ITk Week* — *January 2025*

Demystifying Optimal Transport; *Duke ATLAS Meeting* — *April 2024*

Empirical Estimates of the Entropy of Jets; *Duke ATLAS Meeting* — *January 2024*

Publications

1. *First stave results towards mitigating sensor fracturing with interposers in the ATLAS ITk strips barrel* — *September 2025*
G. D'Amen, D. Dewhurst, E. Dibley, J. Dopke, E. Duden, G. Hawker, B. Gallop, N. Ghorbanian, **P. Jacobson**, M. Kurth, A. Li, D. Lynn, A. Petersen, P. Phillips, D. Russell, C. Sawyer, C. Solaz, W. Sorger, S. Stucci, A. Tishelman-Charny, A. Tricoli, G. van Nieuwenhuizen
JINST

2. *Benchtop Electrochemical Growth and Controlled Alloying of Polycrystalline $In_xGa_{1-x}As$ Thin Films* — *June 2022*
Zachary Lindsey; Malachi West; **Peter Jacobson**; John Robert Ray
Crystal Growth & Design

3. *Crystalline growth and alloying of $In_xGa_{1-x}Sb$ films by electrodeposition onto liquid metal electrodes* — *March 2021*
Zachary Lindsey; M. Moran; **Peter Jacobson**; Q. Smith; M.D. West; Raphael Francisco
Results in Physics

Addendum: *Active Author* of the ATLAS Collaboration — *September 2025 - Present*