James Harbour

Resume

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Education

- **Class of 2025 at the University of Virginia**, Mathematics and Computer Science double major
- Completed the undergraduate requirements for mathematics major during high school.
- Completed the UVA mathematics PhD curriculum as a freshman; passed PhD qualifying exams as a freshman.
- **Graduate level courses**: Machine Learning, Topoloigcal Modular Forms, Operator Algebras, Random Walks on Groups, Functional Analysis, Harmonic Analysis, Complex Analysis, Measure Theory, Differential Topology, Algebraic Topology I & II, Algebraic Geometry, Algebra I & II, Partial Differential Equations,

Mathematics Experience

2024 **Vanderbilt Research**, *Visiting researcher under Dr. Jesse Peterson*, studying von Neumann equivalence and deformation/rigidity theory, supported by the *Harrison Award*

2024 **Purdue Research**, *Visiting researcher under Dr. Thomas Sinclair*, studying tracial joint spectral measures, type III von Neumann algebras, and biexact groups, supported by the *Ingrassia Grant*

2023 **UChicago REU**, Full participant, Studying s-Perimeter and Nonlocal Potential Theory

2022 **UVA Research**, I took an intensive one-on-one reading and research course in operator algebras with Dr. Benjamin Hayes. Living expenses were covered by DMS-2000105.

Selected Talks

10/23 **α-stable Levy Processes and Fractional Laplacians**, *Random Walks on Groups lecture*

07/23 **Asymptotics of the Fractional s-Perimeter**, *University of Chicago REU*

04/23 **Maximal rigidity for L^2-cohomology of Groups and Beyond**, *UVA Operator Algebras seminar*

11/22 **Index Rigidity for type-II_1 Subfactors**, *UVA Operator Algebras seminar*

Selected Travel

01/24 **Joint Math Meetings**, *San Francisco*, speaker, supported by AMS undergraduate travel grant

10/23 **East Coast Operator Algebras Symposium**, *Purdue University*, attendee, supported by NSF grant DMS-2321632

10/23 **Virginia Operator Theory and Complex Analysis Meeting (VOTCAM)**, *Richmond University*, attendee

05/23 **Noncommutative Geometry and Operator Algebras (NCGOA) Spring Institute**, *Vanderbilt University*, attendee

01/23 **Joint Math Meetings**, *Boston*, attendee, supported by NSF grant DMS-2035183

10/22 **East Coast Operator Algebras Symposium**, *Michigan State University*, attendee, supported by NSF grant DMS-2035183

06/22 **Thematic Program in p-adic L-functions and Eigenvarieties - Undergraduate Workshop**, *University of Notre Dame*, participant, supported by NSF grant DMS-1904501

Financial Experience

- **Quant Education Chair for UVA's Alternative Investment Fund** An investment club managing a portfolio of $\$60,000$ AUM with both systematic and discretionary trading strategies. Rigorous selection process with multiple interviews and a 3% acceptance rate. In my role as Quant Education Chair, I run a seminar on the mathematics behind quantitative finance.

Programming Experience

Proficient In Java, C, C++, Assembly, Python, LaTeX, SageMath, Mathematica. I have also taken courses in cybersecurity, computer architectures, machine learning, and algorithmic economics.