Nolan J. Coble

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EDUCATION

University of Maryland, College Park — College Park, MD
Computer Science PhD Student, GPA: 3.92 — 2020–present
- − Application Area: Quantum Information
- − Advised by Matthew Coudron and Alexander Barg

SUNY Brockport — Brockport, NY
B.S. in Mathematics and Physics, GPA: 4.00 — 2016–2020
- − Thesis: "Spectral properties of quaternionic unit gain cycles."
- − Advised by Nathan Reff
- − Member of the Honors college

EXPERIENCE

Los Alamos National Laboratory — Los Alamos, NM
Quantum Computing Summer School Fellowship — Summer 2021
Advisor: Dr. Yigit Subasi
- − Project title: Generating Polynomials of Density Matrices

University of Maryland — College Park, MD
Training and Research Experiences in Nonlinear Dynamics (TREND) REU — Summer 2019
Advisors: Dr. Michelle Girvan, Dr. Ed Ott, Dr. Thomas Antonsen
- − Project title: Predicting Network Dynamics with a Parallel Machine Learning Approach

University of Rochester — Rochester, NY
Photonics REU — Summer 2018
Advisor: Dr. Benjamin Miller
- − Project title: Finite-Element Modeling of Waveguide Structures Using COMSOL Multiphysics

PUBLICATIONS

[1] F. Belardo, M. Brunetti, N. J. Coble, N. Reff, and H. Skogman, "Spectra of quaternion unit gain graphs", *Linear Algebra and its Applications*, vol. 632, pp. 15–49, Jan. 2022, ISSN: 00243795.

[2] K. Srinivasan, N. J. Coble, J. Hamlin, T. Antonsen, E. Ott, and M. Girvan, "Parallel machine learning for forecasting the dynamics of complex networks", *Phys. Rev. Lett.*, vol. 128, p. 164 101, 16 Apr. 2022.

[3] N. J. Coble and M. Coudron, "Quasi-polynomial time approximation of output probabilities of geometrically-local, shallow quantum circuits.", in *Conference on Quantum Information Processing (QIP),* and *Symposium on Foundations of Computer Science (FOCS)*, 2021. arXiv: 2012.05460.

[4] Z. Holmes, N. J. Coble, A. T. Sornborger, and Y. Subaşı, "On nonlinear transformations in quantum computation", Preprint, 2021. arXiv: 2112.12307 [quant-ph].

[5] N. J. Coble and N. Yu, "A reservoir computing scheme for multi-class classification.", in *Proceedings of the 2020 ACM Southeast Conference*, ser. ACM SE '20, Tampa, FL, USA: Association for Computing Machinery, 2020, pp. 87–93, ISBN: 9781450371056.

Graduate Coursework

- **Computer Science:** Intro to Quantum Information Processing, Quantum Algorithms, Quantum Error Correction and Fault-Tolerance, End-to-End Quantum Applications, Scientific Computing, Advanced Numerical Optimization
- **Mathematics:** Algebra I and II, Brauer Groups, Complex Analysis, Differential Geometry

Talks

[1] *Divide-and-conquer method for approximating output probabilities of geometrically-local, shallow-depth quantum circuits*, Presented to The IQC-QuICS Math and Computer Science Seminar, 2021.

Course Projects

- Brauer Groups: Division algebras and space-time block coding. Spring 2022

- End-to-End Quantum Applications: Applications of block encodings in quantum computing. Fall 2021

- Quantum Error Correction and Fault-Tolerance: QKD and error-correcting codes. Fall 2021

- Quantum Algorithms: Hidden subgroup problem for semi-direct product groups. Spring 2021

Languages

- **Intermediate:** MATLAB, Python, Java
- **Beginner:** Bash, LabView

Teaching

- **Graduate Teaching Assistant** for *Precalculus* at University of Maryland (Fall 2020 and Spring 2022)
- **Math Tutor** at SUNY Brockport

Scholarships and Awards

- Aziz Osborn Gold Medal in Teaching Excellence 2021
- University of Maryland Dean's Fellowship 2020
- SUNY Chancellor's Award for Student Excellence 2020
  - Recognizes model students who have integrated academic excellence with other aspects of their lives and is the highest honor bestowed upon a student by the State University of New York system.
- School of Arts and Sciences Outstanding Undergraduate Award 2020
  - Recognizes the School of Arts and Sciences's top undergraduate student.
- Brockport Honors College Scholar Award 2020
- Robert E. Hall Memorial Scholarship for Mathematics 2020
- Department of Computer Science Undergraduate Research Award 2020
- Belva A. Waite Memorial Scholarship 2019, 2016
- Interdisciplinary Award in Mathematics 2018
- Harvard House Award 2018
- Brockport Physics, Mathematics, and Computer Science Award 2018, 2017
- Dean's Citation for Diversity, University of Rochester 2018