

# DHEERAN E. WIGGINS

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in dheeran-wiggins

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## EDUCATION

IN PROGRESS **BS Mathematics**, *University of Illinois Urbana-Champaign*  
JUNE 2023 **HS Diploma**, *Illinois Mathematics and Science Academy*

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## RESEARCH EXPERIENCE

JUN 2024 – PRESENT **Undergraduate Researcher**, *University of Illinois, Department of Mathematics*  
in Operator Quantum Error Correction. Advised by Roy Araiza.

MAY 2024 – PRESENT **Undergraduate Research Fellow**, *Endeavor Health Research Institute*  
in Mathematical Epidemiology and Dynamics. Advised by Anthony Solomonides.

JAN 2024 – JUN 2024 **Research Scholar**, *Illinois Mathematics Lab*  
in Winter Spaces and Operator Quantum Error Correction. Advised by Roy Araiza.

JUN 2023 – SEP 2023 **Undergraduate Researcher**, *NorthShore Reserach Institute*  
in Mathematical Epidemiology and Category Theory in ML. Advised by Anthony Solomonides.

JUN 2023 – AUG 2023 **Research Assistant**, *Northwestern University*  
in Biomedical Engineering. Advised by Jules Dewald and Hongchul Sohn.

APR 2022 – JUN 2023 **Research Intern**, *NorthShore Research Institute*  
in Biomedical Informatics and Mathematical Epidemiology. Advised by Anthony Solomonides.

JUN 2022 – MAR 2023 **Research Collaborator**, *University of Chicago*  
in COVID-19 Outcomes Data Analysis. Under Julian Solway.

MAY 2021 – JUN 2023 **Student Researcher**, *Fermilab*  
in Dark Photon and Doubly Charged Higgs Searches. Advised by Peter Dong.

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## RELEVANT COURSEWORK

### University of Illinois Urbana-Champaign

$\mathcal{G}$  denotes graduate.

- Homotopy Theory $\mathcal{G}$
- Abstract Algebra II $\mathcal{G}$
- Abstract Algebra I $\mathcal{G}$
- Intro to Abstract Algebra II
- Probability Theory
- Abstract Linear Algebra $\mathcal{H}$
- Differential Equations
- Honors Advanced Analysis $\mathcal{H}$
- Algebraic Topology I $\mathcal{G}$
- General Topology $\mathcal{G}$
- Quantum Info Processing Theory
- Honors Real Analysis $\mathcal{H}$
- Fundamental Mathematics $\mathcal{H}$
- Calculus III

$\mathcal{H}$  denotes honors.

### Illinois Mathematics and Science Academy

$\mathcal{I}$  denotes intersession.

- Category Theory $\mathcal{I}$
- Abstract Algebra
- Number Theory
- Linear Algebra
- Multi-variable Calculus
- Single Variable Calculus
- Quantum Mechanics
- Intro to Quantum Computing $\mathcal{I}$
- Modern Physics
- Optics
- Electricity & Magnitism
- Classical Mechanics

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## PAPERS

- IN PREPARATION **Poulin's stabilizer formalism for operator quantum error correction and noncommutative graphs**  
with Anderson et al.
- IN PREPARATION **A mathematical characterization of viral epidemics in a naive population**  
with Anthony Solomonides.

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## TALKS & POSTERS

- MAY 2024 **Winter Spaces and the Stabilizer Formalism**, *Illinois Mathematics Lab Open House*  
with Anderson et al. [Poster](#) advised by Roy Araiza.
- APR 2024 **Modeling a Viral Epidemic With a Concurrent "Misinfodemic"**, *Research Institute Spring Scientific Research Poster Reception*  
[Poster](#) advised by Anthony Solomonides.
- APR 2024 **Modeling a Viral Epidemic With a Concurrent "Misinfodemic"**, *Illinois Undergraduate Research Symposium*  
[Talk](#) advised by Anthony Solomonides.
- APR 2024 **Winter Spaces and the Stabilizer Formalism**, *Illinois Quantum Information Science & Technology (IQIIST) World Quantum Day*  
with Anderson et al. [Poster](#) advised by Roy Araiza.
- APR 2023 **Identification and estimated yield of background events in a search for a doubly charged Higgs boson at CMS**, *American Physical Society April Meeting*  
with Anne et al. [Poster](#) advised by Peter Dong.
- APR 2023 **Identification of optimal production channels for dark photon searches**, *American Physical Society April Meeting*  
with Anne et al. [Poster](#) advised by Peter Dong.
- APR 2023 **Unidirectional build architecture: Refactoring a HEP data collection codebase**, *Annual IMSAloquium*  
[Talk](#) advised by Peter Dong.
- APR 2022 **An investigation of triboson decays into four-lepton final states**, *Annual IMSAloquium*  
with George Bayliss and Jesus Fileto. [Talk](#) advised by Peter Dong.

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## TEACHING

- JAN 2025 **Introduction to Mathematical Quantum Error Correction**, *Illinois Mathematics and Science Academy*  
minicourse of  $\approx 22$  hours, 27 students. [\[course page\]](#)
- JAN 2025 – PRESENT **Course Assistant and Grader**, *University of Illinois Urbana-Champaign*  
Math 220: Calculus

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## EDUCATIONAL EXPERIENCES

- DEC 2024 – PRESENT **Independent Study**, *Limits of the  $n$ -qubit Pauli Group and Geometric Group Theory*  
with Igor Mineyev.
- JUL 2024 – PRESENT **Directed Reading**, *Homotopy Type Theory (HoTT)*  
with Anthony Solomonides.
- JUL 2023 **Student**, *Princeton Summer School on Condensed Matter Physics*, Princeton, NJ

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## PROFESSIONAL AFFILIATIONS

MAR 2024 – PRESENT **Member**, *American Mathematical Society*

FEB 2023 – PRESENT **Member**, *American Physical Society*

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## RELEVANT SKILLS

SYMBOLIC	SageMath, Maple, Mathematica	NUMERICAL	MATLAB, Scilab, GNU Octave
PROGRAMMING	Python, C++, Java	MARKUP	L <sup>A</sup> T <sub>E</sub> X, HTML, CSS
LANGUAGES	English <i>fluent</i> , Tamil <i>spoken</i> , Russian <i>intermediate</i> , Spanish <i>elementary</i>		