

# DHEERAN E. WIGGINS

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in dheeran-wiggins

## EDUCATION

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

## RESEARCH EXPERIENCE

JUN 2024 – PRESENT **Undergraduate Researcher**, *University of Illinois, Department of Mathematics*  
in Operator Quantum Error Correction. Advised by Roy Araiza.  
JUN 2025 – JUL 2025 **Fellow**, *MathQuantum Research Training Group, University of Maryland*  
in Ultraproducts and Density Operators. Advised by Maicol Ochoa.  
MAY 2024 – SEP 2024 **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.  
APR 2022 – SEP 2023 **Research Intern**, *NorthShore Research 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.  
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.

## RELEVANT COURSEWORK

### University of Illinois Urbana-Champaign

$\mathcal{G}$  denotes graduate.

- Topological Field Theories in 2D $\mathcal{G}$
- Rep-theoretic Methods in QIT $\mathcal{G}$
- Abstract Algebra II $\mathcal{G}$
- Abstract Algebra I $\mathcal{G}$
- Intro to Abstract Algebra II
- Abstract Linear Algebra $\mathcal{H}$
- Honors Real Analysis $\mathcal{H}$
- Differential Equations
- Homotopy Theory $\mathcal{G}$
- Algebraic Topology II $\mathcal{G}$
- Algebraic Topology I $\mathcal{G}$
- General Topology $\mathcal{G}$
- Quantum Info Processing Theory
- Symbolic Logic
- Fundamental Mathematics $\mathcal{H}$
- Probability Theory

$\mathcal{H}$  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
- Sound & Light
- Electricity & Magnetism
- Classical Mechanics

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## TALKS

- APR 2025 **A model for the infinite tensor product of groups: Insights from quantum information**, *Illinois Undergraduate Research Symposium*  
**Talk** advised by Igor Mineyev.
- MAR 2025 **On noncommutative graphs and Poulin's stabilizer formalism**, *Rose-Hulman Undergraduate Mathematics Conference*  
**Talk** advised by Roy Araiza.
- 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 (IQUIST) 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 2026 **Monoidal Categories for Quantum Theory**, *Illinois Mathematics and Science Academy*  
Minicourse for Intersession 2026
- JAN 2026 **Introduction to Quantum Computing and Algorithms**, *Illinois Mathematics and Science Academy*  
with Anastasia Perry. Minicourse for Intersession 2026
- JUN 2025 – AUG 2025 **Hidden Subgroups and Quantum Computation**, *Illinois Mathematics and Science Academy*  
Minicourse for Summer 2025 ([course page](#))
- JUL 2025 **Quantum Channels and Error Correction**, *University of Maryland*  
Lecture for MathQuantum 2025 High School Fellowship ([slides](#))
- JAN 2025 **Introduction to Mathematical Quantum Error Correction**, *Illinois Mathematics and Science Academy*  
Minicourse for Intersession 2025 ([course page](#))
- JAN 2025 – PRESENT **Course Assistant and Grader**, *University of Illinois Urbana-Champaign*  
Math 220: Calculus, Math 231: Calculus II

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## LEARNING

- AUG 2025 – PRESENT **Reading Course**, *Monoidal, enriched, and dagger categories*  
with Charles Rezk.
- DEC 2024 – PRESENT **Independent Study**, *Infinite tensor products in quantum*  
with Igor Mineyev.
- AUG 2025 **Summer School on Geometry**, *Universiteit Utrecht*, Utrecht, Netherlands
- FEB 2025 – JUN 2025 **Reading Seminar**, *Rudiments of von Neumann algebras*  
with Jihong Cai and Roy Araiza.
- JUL 2023 **Summer School on Condensed Matter Physics**, *Princeton University*, 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>		