Dheeran E. Wiggins

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Education

In Progress	**BS Mathematics**, *University of Illinois Urbana-Champaign*
June 2023	**HS Diploma**, *Illinois Mathematics and Science Academy*

Research Experience

Jun 2025 – Jul 2025	**Fellow**, *MathQuantum Research Training Group, University of Maryland* in Ultraproducts and Density Operators. Advised by Maicol Ochoa.
Jun 2024 – Present	**Undergraduate Researcher**, *University of Illinois, Department of Mathematics* in Operator Quantum Error Correction. Advised by Roy Araiza.
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

G denotes graduate.

- Topological Field Theories in 2D^G
- Homotopy Theory^G
- Representation Theory Methods in QIT^G
- Algebraic Topology II^G
- Abstract Algebra II^G
- Algebraic Topology I^G
- Abstract Algebra I^G
- General Topology^G
- Intro to Abstract Algebra II
- Quantum Info Processing Theory

H denotes honors.

- Abstract Linear Algebra^H
- Symbolic Logic
- Honors Real Analysis^H
- Fundamental Mathematics^H
- Differential Equations
- Probability Theory

Illinois Mathematics and Science Academy

I denotes intersession.

- Category Theory^I
- Quantum Mechanics
- Abstract Algebra
- Intro to Quantum Computing^I
- Number Theory
- Modern Physics
- Linear Algebra
- Sound & Light
- Multi-variable Calculus
- Electricity & Magnetism
- Single Variable Calculus
- Classical Mechanics

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.

Teaching

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

Learning

Aug 2025 – Present   **Reading Course**, *Monoidal (∞-)categories and operads*
with Charles Rezk.

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.

Dec 2024 – Present   **Independent Study**, *Infinite Tensor Products of Groups and Hilbert Spaces*
with Igor Mineyev.

Jul 2023   **Summer School on Condensed Matter Physics**, *Princeton University*, Princeton, NJ

Professional Affiliations

Mar 2024 – Present   **Member**, *American Mathematical Society*

Feb 2023 – Present   **Member**, *American Physical Society*

Relevant Skills

Symbolic	SageMath, Maple, Mathematica	Numerical	matlab, Scilab, gnu Octave
Programming	Python, C++, Java	Markup	LaTeX, html, css
Languages	English *fluent*, Tamil *spoken*, Russian *intermediate*, Spanish *elementary*		