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 2024 – Present **Undergraduate Researcher**, *University of Illinois, Department of Mathematics*
in Noncommutative Graphs. 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.

Apr 2022 – 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 Operator Quantum Error Correction. Advised by Roy Araiza.

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.

- Geometric Group Theory$^{\mathcal{G}}$
- Group Representation Theory$^{\mathcal{G}}$
- 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
- Advanced Symbolic Logic
- 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

Talks

Mar 2026 **Stabilizer formalism in ∞-qubit systems**, *American Physical Society Global Physics Summit*
with Igor Mineyev.

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

Jan 2026 **Monoidal Categories for Quantum Theory**, *Illinois Mathematics and Science Academy*
Minicourse for Intersession 2026 (course page)

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 (SP25), Math 231: Calculus II (FA25, FA26)

Learning

Jan 2026 – Present **Modern and classical homotopy theory**, *University of Illinois*, Champaign, IL
Reading course with Jeremiah Heller.

Jan 2026 – Present **Tensor categories**, *University of Illinois*, Champaign, IL
Reading course with Charles Rezk.

Dec 2024 – Present **Infinite tensor products in quantum**, *University of Illinois*, Champaign, IL
Independent study with Igor Mineyev.

Aug 2025 – Dec 2025 **Monoidal, enriched, and dagger categories**, *University of Illinois*, Champaign, IL
Reading course with Charles Rezk.

Aug 2025 **Summer School on Geometry**, *Universiteit Utrecht*, Utrecht, Netherlands

Feb 2025 – Jun 2025 **Rudiments of von Neumann algebras**, *University of Illinois*, Champaign, IL
Reading seminar with Jihong Cai and Roy Araiza.

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*