Dheeran E. Wiggins

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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.

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.

Relevant Coursework

University of Illinois Urbana-Champaign

$^{\mathcal{G}}$ denotes graduate.
$^{\mathcal{H}}$ denotes honors.

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

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

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.

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* (*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.

Professional Affiliations

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

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

Educational Experiences

Jul 2024 **Directed Reading**, *Homotopy Type Theory* (*HoTT*)
with Anthony Solomonides.

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

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*