Hannah Scanlon

Mathematics PhD Candidate, Duke University

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Mathematical biologist skilled in mathematical modeling, simulation, communication and critical thinking and passionate about interdisciplinary collaborations.

Education

Duke University — **Durham, NC**
PhD in Mathematics - *in progress* — August 2021–May 2026 (expected)

- Research focus in multiscale modeling of human physiology

Wake Forest University — **Winston Salem, NC**
BS in Applied Mathematics, Minor in Biology — August 2017–May 2021

- Graduated Summa Cum Laude with Honors in Applied Mathematics

Work Experience

SimulationsPlus, DILIsym Services
Quantitative Systems Pharmacology Modeling Intern — Summer 2023

- Advanced RENAsym software by implementing a model of podocyte bioenergetics and function. Responsibilities included scoping biological and mathematical literature, developing and parameterizing equations, and presenting progress updates to RENAsym team and scientific advisory board in quarterly meeting

Research Experience

Multiscale Modeling of Microtubule and Protein Dynamics in Injured Neurons
Graduate Thesis Work — Summer 2022–Current

- Developing stochastic and deterministic mathematical models to develop a better understanding of the sub-cellular mechanisms that support neuronal resilience, in close collaboration with a biology lab

Modeling the Spread of Infectious Diseases on an Adaptive Network
Undergraduate Thesis — Fall 2018–Summer 2021

- Developed a stochastic network model and a dynamical systems model approximation to investigate the dynamics of disease spread when the population is allowed to avoid interactions with infectious individuals
- Published research as first primary author publication in Spora: A Journal of Biomathematics

Modeling the Economic Impact of Covid-19
Summer Workshop — Summer 2020

- Collaborated with a diverse cohort of scientists to adapt research experience to contribute to pressing questions related to the ongoing COVID-19 pandemic
- Investigated methods to minimize the economic impact of the pandemic measured as a function of labor loss and healthcare cost with an optimal control theory model

Metabolic Signaling in a Model of the Human Retinal Microcirculation
Summer Research Experience for Undergraduates — Summer 2019

- Extended an existing model of blood flow to introduce biologically relevant signaling and developed a new hybrid model combining spatial clinical measurements with a theoretical model
- Published research as first co-authored publication in Photonics and has been used in clinical setting at the Glick Eye Institute to inform glaucoma treatment

Significant Awards

- **NSF Graduate Research Fellowship**, Honorable Mention — Spring 2021
  National fellowship which recognizes outstanding graduate students expected to contribute significantly to research, teaching, and innovations in science and engineering
- **John Y. Phillips Prize in Mathematics** — Spring 2021
  Awarded by the Wake Forest Mathematics Department to top graduating undergraduate mathematics major
- **Barry S. Goldwater Scholarship** — Spring 2020
  One of the most prestigious national STEM scholarships awarded to undergraduates who show exceptional promise to becoming the next generation of research leaders in their field
- **Stamps Leadership Scholarship** — Fall 2017–Spring 2021
  Full-ride, merit based scholarship awarded jointly by Wake Forest University and the Stamps Foundation to students exemplifying extraordinary scholarship and leadership

Engagement and Service

Mathematics Instructor — Spring 2019–Current

- Taught Calculus 2 to class of 25 freshmen students with a variety of intended majors. Receive consistent positive reviews from both enrolled students and observing faculty for high class engagement, clear communication and accessible explanations
- Additional experience as Lab Instructor for Calculus 1, TA for Differential Equations and Probability, and Tutor for over 10 different courses

Math Modeling Competition Organizer — Summer 2022–Current

- Organizer for a local mathematical modeling competition, Triangle Competition in Mathematical Modeling which allows undergraduate students to investigate an open-ended real-world problem. Collaborated with organizers at five other institutions to develop competition problems and coordinated local contest

Association for Women in Mathematics Chapter President — Fall 2020–Current

- Current Chapter President at Duke and former Chapter President at Wake Forest, focused on fostering community, inclusivity and collaboration through a variety of programs including mentorship groups, presentation opportunities, equity discussions and social events

Conference and Bootcamp Organizer — Fall 2019–Spring 2022

- Co-organizer for Triangle Area Graduate Mathematics Conference, a graduate level conference aimed at strengthening the local mathematics community, a bootcamp for incoming Duke Math PhD students to prepare them to start graduate school and Integrating Research in Science Conference at Wake Forest, an undergraduate conference which celebrates interdisciplinary interactions
- Fulfilled a variety of rolls as an organizer including recruiting speakers and panelists, designing websites, facilitating a mathematical activities fair and coordinating with partner institutions

Workshops and Conference Presentations — Summer 2019–Current

- Selected to conduct research at various workshops including modeling the tradeoffs in publishing urban travel data sets and exploring machine learning techniques to pre-process sparse, non-uniform medical data
- Highly awarded for presentations at various conferences including most recently Lewis Wolpert Best Poster Award at the Society of Mathematical Biology Annual Meeting in 2023

Skills

- **Languages:** English(native), Spanish(conversational)
- **Programs:** MatLab(advanced), Python(proficient), LaTex(proficient), Java(moderate), C++(basic)
- **Data Science and Machine Learning:** Data Visualization, Logistic Regression, SVM, Neural Networks, etc.