Katherine Moore

Manchester Hall

Wake Forest University

Winston-Salem, NC

mooreke@wfu.edu

Webpage: **katherinemath.com**

github.com/moorekatherine

EDUCATION

Dartmouth College, Hanover, NH

    Ph.D. in Mathematics   June 2018

        Patterns in Time Series and Dynamical Systems

        Advisor: Sergi Elizalde

    A.M. in Mathematics

Kenyon College, Gambier, OH

    B.A. in Mathematics (with Highest Honors in Mathematics)   May 2012

ACADEMIC APPOINTMENTS

Amherst College, Amherst, MA

    Visiting Assistant Professor   Fall 2021 -

Wake Forest University, Winston-Salem, NC

    Teacher-Scholar Postdoctoral Fellow   Fall 2018 - Spring 2021

RESEARCH INTERESTS

I primarily work in applied probability and my work often includes connections with combinatorics, discrete dynamical systems, time series and networks. I'm particularly interested in socially-motivated approaches for revealing structure in information-scarce environments; and the manner in which local behavior can give rise to, or give insight into, interesting global properties.

PUBLICATIONS

($\star\star$ indicates Master's student and $\star$ indicates undergraduate student)

1. A social perspective on perceived distances reveals deep community structure (with K. Berenhaut and R. Melvin**), (submitted).

2. Characterizations and enumerations of patterns of signed shifts (with S. Elizalde) *Discrete Applied Mathematics*, **(2019)**.

3. Random Walk Null Models for Time Series Data (with D. DeFord) *Entropy*, 19 (2017), **615**.

4. Patterns of signed shifts and negative shifts (with S. Elizalde and K. Archer) *Sem. Lothar. Combin. proc.,* 78B (2017), Article **#49**.

5. Patterns of negative shifts and beta-shifts. (with S. Elizalde) December 2015. arXiv:**1512.04479**.

Awards and Honors

- Project NExT (Fellow)   2019 - 2020
- Outstanding Graduate Student Teacher   2017
  Awarded by the Dartmouth Center for Advancement of Learning.
- Dartmouth GAANN Fellowship   2012 - 2013
- Reginald B. Allen Award for Excellence in Mathematics at Kenyon College   2012
- Outstanding Pi Mu Epsilon Student Talk at MathFest (advised by Judy Holdener)   2011

Research Presentations

($\star$ indicates invited talk)

- *Communities in Data via Partitioned Local Depths*
  CanaDAM, Canada Mathematical Society.   May 2021

- *"Communities in Data" Colloquiums* (all virtual)
  ($\star$) Lenoir-Rhyne University, NC.   April 2021
  ($\star$) University of Montana, MT.   March 2021
  ($\star$) Amherst College, MA.   March 2021
  ($\star$) Kenyon College, OH.   February 2021
  Wake Forest University, NC.   April 2020

- *Communities in Data*
  Data Science, Statistics and Visualization, SAMSI, NC.   July 2020
  Interdisciplinary Applied Math Seminar (Lab of Feng Fu), Dartmouth College, NH.   March 2020
  Interdisciplinary Network Science Seminar, Wake Forest University, NC.   March 2020

- *A New Perspective on Clustering: Partitioned Local Depth*
  ($\star$) 34th Clemson Mini-Conference on Discrete Math and Algorithms, Clemson, SC.   October 2019
  ($\star$) Math Colloquium, High Point University, NC.   October 2019

- *Clustering via Partitioned Local Depth*
  CanaDAM, Vancouver, BC.   May 2019

- *Clustering and Partitioned Local Depth*
  Math and Statistics Colloquium, Wake Forest University, NC.   February 2019
  ($\star$) Math and Computer Science Coffee, Davidson College, NC.   February 2019

- *Permutations Realized by Iterated Maps*
  ($\star$) Dynamical Algebraic Combinatorics AMS Special Session, San Diego, CA.   January 2018

- *Permutation-based Techniques for Estimating Entropy of Time Series*
  Applied and Computational Mathematics Seminar, Dartmouth College, NH.   September 2017

- *Permutations in Time Series and Dynamical Systems*
  ($\star$) Combinatorics Seminar, Brandeis University, MA.   September 2017
  ($\star$) New York Combinatorics Seminar, Brooklyn College, NY.   September 2017

- *Patterns and Cyclic Permutations in Dynamical Systems*
  Summer Combo in Vermont, Saint Michael's College, VT.   July 2017
  Permutation Patterns, Reykjavik University, Iceland.   June 2017
  ($\star$) Combinatorics Seminar, Brandeis University, MA.   January 2017

- *Patterns Realized by Negative Shifts and Beta-Shifts*
  Summer Combo in Vermont, Saint Michael's College, VT.   July 2016

- *Patterns in Chaos*
  Graduate Student Combinatorics Conference, Clemson University, SC.   April 2016
  ($\star$) Math Colloquium, Kenyon College, OH.   September 2015

19th Annual Graduate Student & Postdoc Research Day, Wake Forest University, NC.	March 2019
Formal Power Series and Algebraic Combinatorics (FPSAC), Queen Mary, London, UK.	July 2017
Discrete Math Days of the Northeast, Dartmouth College, NH.	May 2017
Graduate Poster Session, Dartmouth College, NH.	April 2017
Women's Intellectual Network Research Symposium, Brown, RI.	March 2017

TEACHING

Wake Forest University
Instructor

Stats 310/610, Math 357 - Probability	Fall 2020, Spring 2021
Stats 111 - Introduction to Statistics	Fall 2020, Spring 2020, Spring 2021
Math 117 - Discrete Mathematics (introduction to proofs)	Fall 2019, Spring 2019
Math 111 - Calculus with Analytic Geometry	Fall 2018
Math 311 - Introductory Real Analysis	Fall 2018

Dartmouth College
Instructor

Math 53 - Chaos!	Fall 2017
Math 20 - Probability	Summer 2016
Math 2 - Differential Calculus	Winter 2016

Teaching Assistant

Math 8 - Integral Calculus	Fall 2013, Winter 2015
Math 12 - Honors Multivariable Calculus for First Years	Fall 2012

OTHER TEACHING ACTIVITIES

Project NExT (Fellow)	2019 - 2020
Peer Learning Workshop on Online Learning (Statistics, Wake Forest)	2020
"Small Teaching Online" Group (Center for the Advancement of Teaching at Wake Forest)	2020
Dartmouth Mathematics Teaching Seminar	2015

An intensive 120-contact hour course including discussion, implementation and supervision.

Dartmouth Center for the Advancement of Learning	2015 - 2017

Frequent workshop participant (e.g., *Improv for Researchers Series*).

SUPERVISED RESEARCH PROJECTS

URECA Fellowship for Undergraduate Summer Research

Kevin Woytowich	Summer 2019, 2020

Price Differences in Revisiting Non-Revisiting Random Walks

Master's Thesis Committee Member

Orlando Ferrer	May 2020

Price Dynamic Random Walks on General Graphs

Yichen Han	May 2020

Degree-wise Effects and the Friendship Paradox Under Configuration Models

Community

Dartmouth Center for the Advancement of Learning 2015 - 2017
Led sessions for graduate teaching assistants on diversity and inclusivity in the classroom.
AWM Mentor Program at Wake Forest (Mentor) 2019 - Present
Sonia Kovalevesky Day 2012 - 2018
Organized the annual math day (May 2016), participated on the panel and led sessions.
Exploring Mathematics at Dartmouth 2015
Collaboratively developed two week-long workshops for high school students.

Service

Graduate Admissions Committee (Wake Forest) 2019 - 2020
Curriculum Committee Member (Wake Forest) 2018 - 2019
Advisory Board Member (Dartmouth Center for the Advancement of Learning) 2017 - 2018