

BRYSON G. KAGY

BgKagy@ncsu.edu \diamond North Carolina State University

EDUCATION

North Carolina State University

2019-Present

PhD Advisor: Seth Sullivant

Anticipated graduation: Spring 2025

Master's in Mathematics, May 2021

Qualifying exams in Combinatorics, Algebra, and Linear algebra/Lie Theory

Georgia Institute of Technology

2015-2019

B.S. Mathematics with Pure Mathematics concentration, May 2019

B.S. Physics, May 2019

Science and Math Research Training (SMaRT) Program

RESEARCH INTERESTS

algebraic statistics, phylogenetics algebraic combinatorics, phylogenetic networks, coalescence model, algebraic geometry, polyhedral geometry, graphical models, graph theory, cluster algebras, coxeter groups, game theory, fair division.

PUBLICATIONS

Equidistant Circular Split Networks

2024

with Seth Sullivant. [Arxiv.org/abs/2402.11032](https://arxiv.org/abs/2402.11032).

New directions in algebraic statistics: Three challenges from 2023

2024

with Yulia Alexandr, Miles Bakenhus, Mark Curiel, Sameer K. Deshpande, Elizabeth Gross, Yuqi Gu, Max Hill, Joseph Johnson, Vishesh Karwa, Jiayi Li, Hanbaek Lyu, Sonja Petrović, Jose Israel Rodriguez. [Arxiv.org/abs/2402.13961](https://arxiv.org/abs/2402.13961). To appear in Algebraic Statistics.

AWARDS AND HONORS

Fall 2024 ICERM semester program participant

Summer 2024 AMS MRC on Algebraic Combinatorics participant

Fall 2023 IMSI long program participant

2023 Preparing the Professoriate participant

Spring 2019 North Carolina State University Provost Fellowship

2017-2018 Georgia Institute of Technology School of Mathematics Outstanding Math Major Award

TEACHING EXPERIENCES

North Carolina State University

Summer 2020-Present

- **As Primary Instructor:**
- Fall 2024 MA 405- Introduction to Linear Algebra and Matrices
- Spring 2024 MA 103- Intro to Contemporary Math, As part of Preparing the Professoriate
- Fall 2023 MA 103- Intro to Contemporary Math
- Spring 2023 MA 103- Intro to Contemporary Math
- Fall 2022 MA 103- Intro to Contemporary Math

- Summer 2022 MA 241- Calculus 2
- Spring 2022 MA 241- Calculus 2
- Fall 2021 MA III- Precalculus
- **As Recitation Leader:**
- Summer 2021 MA 141- Calculus 1
- Spring 2021 MA 241- Calculus 2
- Fall 2020 MA 241- Calculus 2

North Carolina Governor's Honors School Instructor

Summer 2023-Summer 2024

- 4 week summer program for gifted high schoolers from across the state
- Designed and gave my own course on graph theory and combinatorics. Gave an introductory exposure to proofs as well. Advised multiple groups on their final cornerstone math research projects.

Georgia Institute of Technology

Fall 2016-Fall 2018

- **As Recitation Leader:**
- Fall 2018 Math 1552- Calculus 2
- Spring 2018 Math 1552- Calculus 2
- Fall 2017 Math 1552- Calculus 2
- Spring 2017 Math 1552- Calculus 2
- Fall 2016 Math 1551- Calculus 1

TECHNICAL STRENGTHS

Computer Languages Java, LaTeX, Polymake, Macaulay2, Maple, Python

PRESENTATIONS AND TALKS

- 2024 Graduate Students Combinatorics Conference: "A Description of the Polyhedral Geometry of Equidistant Phylogenetic Networks"
- 2024 Graduate Recruitment Weekend: "A Description of the Polyhedral Geometry of Equidistant Phylogenetic Networks"
- 2024 Joint Mathematics Meeting AMS Special Session on Algebraic Approaches to Mathematical Biology: "A Description of the Polyhedral Geometry of Equidistant Phylogenetic Networks"
- Fall 2023 IMSI long program - Algebraic Statistics and Our Changing World: "A Description of the Polyhedral Geometry of Equidistant Phylogenetic Networks"
- 2019 National Conference on Undergraduate Research: "Fair Division for Drawing Legislative Districts"
- 2018 SIAM LA-TX conference: "Fair Division for Drawing Legislative Districts"

POSTERS

- 2024 International Symposium on Symbolic and Algebraic Computation: "A Description of the Polyhedral Geometry of Equidistant Phylogenetic Networks"
- 2024 Graduate Student Meeting in Applied Algebra and Combinatorics: "A Description of the Polyhedral Geometry of Equidistant Phylogenetic Networks"
- 2019 Joint Mathematics Meeting: "Fair Division for Drawing Legislative Districts"
- 2018 Joint Mathematics Meeting: "One-Bit Johnson-Lindenstrauss Lemma"
- 2017 Young Mathematicians Conference: "One-Bit Johnson-Lindenstrauss Lemma"

WORKSHOPS AND CONFERENCES ATTENDED

Fall 2024 ICERM semester program- "Theory, Methods, and Applications of Quantitative Phylogenomics"
Summer 2024 University of Hawaii Algebraic Methods in Phylogenetics Workshop
Summer 2024 AMS MRC on Algebraic Combinatorics
Fall 2023 IMSI long program - "Algebraic Statistics and Our Changing World"
Summer 2022 Joint MSRI-BIRS Graduate Summer School - "Sums of Squares Method in Geometry, Combinatorics and Optimization"

OUTREACH

Math Doesn't Bug Me	Fall 2019
Volunteer	
Emory Math Circle	Summer 2019
Teaching Assistant	
Mathapalooza Exhibit	Fall 2018-Spring 2019
Organizer	
Seven Bridges of Königsberg Show	Fall 2018
Organizer	