

# Johnny Rivera, Jr.

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## Education

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**Virginia Polytechnic Institute and State University**, Blacksburg, VA 2024 - Present  
M.S., Mathematics  
Expected graduation: May 2026  
Advisor: Daniel Orr

**Davidson College**, Davidson, NC 2020-2024  
B.S., Mathematics. *Magna Cum Laude*.  
Departmental High Honors in Mathematics  
Thesis Advisor: Yan Zhuang

## Work Experience

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### Virginia Polytechnic Institute and State University

- Graduate Teaching Assistant August 2024 - Present
  - Host three hours of office hours weekly to meet with students, study, and answer questions about homework.
  - Meet weekly with Calculus 1 instructors to discuss student engagement and weekly grading assignments.
  - Grade written questions and provide feedback.
  - Facilitate active learning weekly by answering student questions.

### Davidson College

- Embedded Tutor for 'Calculus 1 and Modeling' August 2023 - May 2024
  - Hosted office hours three times a week to meet with students, study, and answer questions about homework.
  - Meet with an instructor for half an hour every week to discuss growth and concerns of students and to plan for the upcoming week.
- Grader for 'Programming and Problem Solving' January 2022 - May 2022
  - Graded homeworks and quizzes.

### MathPath

- Counselor Summer 2022, 23', and 24'
  - Maintained the health, safety, and well-being of 9 assigned students
  - Assisted student learning in courses including: Metric Spaces, Catalan Numbers, Number Theory, Ducci Sequences, and more.

- Taught a week-long breakout course titled ‘Bijective Proofs’ where students learned to formulate and prove counting arguments with an emphasis on defining bijections.

## Awards

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### The William G. McGavock Award

2024

One of two recipients of the William G. McGavock Mathematics award. The award is given to that member of the senior class who has demonstrated the greatest promise and accomplishments in mathematics during his or her Davidson career. The award is given by the Mathematics and Computer Science Department annually, when it feels there are qualified candidates.

## Publications and Preprints

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- 1) Counting pattern-avoiding permutations by big descents, with Sergi Elizalde and Yan Zhuang.  
Submitted. [[arXiv.2408.15111](https://arxiv.org/abs/2408.15111)]

## Invited Talks

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- Counting Pattern Avoiding Permutations by Big Descents
  - *VT Algebra Seminar*, Virginia Polytechnic Institute and State, Blacksburg, VA Oct. 2024
  - *Special Session on Enumerative Combinatorics*, AMS Fall Central Sectional Meeting, University of Texas at San Antonio, San Antonio, TX Sep. 2024
  - *Graduate Student Seminar*, Virginia Polytechnic Institute and State, Blacksburg, VA Sep. 2024

## Conferences

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- New York State Regional Graduate Mathematics Conference Mar. 2025  
Syracuse University, Syracuse, NY
- AMS Central Sectional Meeting Sep. 2024  
University of Texas at San Antonio, San Antonio, TX
- Triangle Lectures in Combinatorics Dec. 2022  
University of North Carolina at Greensboro, Greensboro, NC

## Workshops And Other Professional Development

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- Mid-Atlantic Region Math Alliance Spring Meeting  
University of Virginia, Charlottesville, VA
- Mar. 2025