

# Lucy Martinez

Department of Mathematics, Rutgers University

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## EDUCATION

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<b>Ph.D. Mathematics</b> , Rutgers University	Expected 2027
Advisor: Doron Zeilberger	
<b>M.S. Mathematics</b> , Rutgers University	May 2023
Awarded upon completion of written qualifying exams	
<b>B.S. Mathematics</b> , Stockton University	May 2021
Minor in Computer Science	

## RESEARCH INTERESTS

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Combinatorics, probability, experimental mathematics, symbolic computation, random walk

## FELLOWSHIPS, AWARDS, AND GRANTS

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### Fellowships

Rutgers School of Arts and Sciences Excellence Fellowship	2026 - 2027
Rutgers School of Arts and Sciences Excellence Fellowship	2022 - 2023
Rutgers School of Graduate Studies Dean's Fellowship	2021 - 2022
National Science Foundation Graduate Research Fellowship (NSF-GRFP)	2021 - 2026

### Awards and Grants

MAA Tensor Women & Mathematics Grants: EDGE Webinar (\$5,947.20)	2025 - 2026
Joel Lebowitz Fellowship, Rutgers University (\$2,500)	July 2025
Travel Award, AWM Research Symposium (\$2,000)	May 2025
SIAM Student Travel Award, SIAM (\$650)	2025
SGS Research & Travel Award, Rutgers University (\$1,000)	2024 - 2025
SIAM Student Travel Award, SIAM (\$800)	2024
Dr. Sylvia T. Bozeman Predoctoral Fellowship (\$350)	March 2024
SGS Research & Travel Award, Rutgers University (\$1,000)	2023 - 2024
AAECC Best Paper Award of 2022, AAECC (€4,000)	2023
Awarded for publication #2: <i>On Kostant's weight <math>q</math>-multiplicity formula for <math>\mathfrak{sl}_4(\mathbb{C})</math></i>	
FoCM Conference Travel Award (\$1,900)	June 2023
Dr. Sylvia T. Bozeman Predoctoral Fellowship (\$500)	June 2023
Princeton Prospective PhD Preview Program - Honorific Mention	2020
High Impact Practices Scholarship, Stockton University (\$500)	December 2020
Stockton University REU Award (\$1,000)	December 2019
Stockton Student Travel Fund (\$1,250)	October 2019

Stockton University Foundation Scholarship (\$5,180)	2019 - 2021
Math Alliance Scholar	2019 - 2021
Hispanic Fund Scholarship	2019 - 2021

## PUBLICATIONS

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### Preprint

12. *How many coin tosses would you need until you get  $n$  Heads or  $m$  Tails?*. S. Janson, L. Martinez, and D. Zeilberger. arXiv:2512.07803 (2025).
11. *Enumerating vector parking functions and their outcomes based on specified lucky cars*. M. Ferreri, P. E. Harris, L. Martinez and E. Swartz. arXiv:2508.13917 (2025).

### Accepted/In Press

10. *Lucky cars in Fubini rankings and unit Fubini rankings*. C. Barreto, M. Beerbower, J. Elder, P. E. Harris, L. Martinez, J. L. Ramírez, S. Ramírez, G. Shirley, and J. C. Vásquez. To appear in *Studia Scientiarum Mathematicarum Hungarica*. arXiv:2510.27574.
9. *Parking functions with a fixed set of lucky cars*. P. E. Harris and L. Martinez. To appear in the *Bulletin of the Institute of Combinatorics and its Applications*. arXiv:2410.08057.

### Published

8. *A symbolic computational approach to the generalized gambler's ruin problem in one and two dimensions*. L. Martinez. *Journal of Difference Equations and Applications*, (2025), 1–25.
7. *Primeness of generalized parking functions*. S. Armon, J. Beckford, D. Hanson, N. Krawzik, O. Mandelshtam, L. Martinez, and C. Yan. *The Electronic Journal of Combinatorics*, Vol. 32 (2025), no. 4, P4.48.
6. *Hitting  $k$  primes by dice rolls*. N. Alon, Y. Malinovsky, L. Martinez, and D. Zeilberger. *The Electronic Journal of Combinatorics*, Vol. 32 (2025), no. 4, P4.16.
5. *Pullback parking functions*. J. Elder, P. E. Harris, L. Koene, I. Lavene, L. Martinez, and M. Oldham. *American Journal of Combinatorics*, Vol. 4 (2025), 1-22.
4. *A guide to the risk-averse gambler and resolving the St. Petersburg paradox once and for all*. L. Martinez and D. Zeilberger. *The College of Mathematics Journal*, Vol. 55 (2024), no. 3, 226-234.
3. *Repetitions of Pak-Stanley labels in  $G$ -Shi arrangements*. C. Bennett, L. Martinez, A. Mock, G. Rojas Kirby, and R. Truax. *Discrete Mathematics*, Vol. 347 (2024), no. 9.
2. *On Kostant's weight  $q$ -multiplicity formula for  $\mathfrak{sl}_4(\mathbb{C})$* . R. E. Garcia, P. E. Harris, M. Loving, L. Martinez, D. Melendez, J. Rennie, G. Rojas Kirby, and D. Tinoco. *Applicable Algebra in Engineering, Communication and Computing*, Vol. 33 (2022), no. 4, 353-418.

### Expository

1. *How many dice rolls would it take to reach your favorite kind of number?* L. Martinez and D. Zeilberger. *Maple Transactions*, Vol. 3 (2023), no. 3, Article 15953.

## TEACHING EXPERIENCE

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### Institute for Pure & Applied Mathematics

Teaching Assistant, Practicum for Undergraduate Mathematicians April 2024  
Three 1-hour problem sessions on introductory topics in matroid theory.

### Rutgers University

Teaching Assistant  
Calculus II for the Mathematical and Physical Sciences Fall 2025  
Calculus I for the Mathematical and Physical Sciences Fall 2024  
Grader, Computer Science Linear Programming Graduate Course Fall 2023  
Academic Success Mentor Fall 2022 - Spring 2024

### Stockton University

Teaching Assistant  
Quantitative Reasoning Spring 2018 - Spring 2021  
Educational Opportunity Fund Summer 2018  
Assisted students during assigned math modules for a six-week program designated for low-income students.  
Mathematics Tutor (F20-S21 Head Tutor) Spring 2018 - Spring 2021

## MENTORING EXPERIENCE

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University of Puerto Rico, Ponce Summer 2024  
Graduate research mentor for the Combinatorics and Coding Theory in the Tropics REU  
Brown University, ICERM institute Summer 2022  
Graduate research mentor for the Summer@ICERM: Computational Combinatorics REU

## INVITED TALKS

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Parking Functions with a Fixed Set of Lucky Cars, EDGE Special Session, AWM Research Symposium, May 16, 2025

Primeness of Vector Parking Functions, MRC Algebraic Combinatorics Special Session, Joint Mathematics Meetings, January 9, 2025

The  $G$ -Shi Arrangement: Pak-Stanley Labels and Games on Paths, Special Session on Enumerative Combinatorics, AMS Fall Central Sectional, University of Texas, September 14, 2024

How Many Dice Rolls Would It Take to Hit Your Favorite Kind of Number?, Special Session on The EDGE Program, Joint Mathematics Meetings, January 4, 2024

The Power of Computation, Mathematics and Statistics Colloquium, The College of New Jersey, October 18, 2023

The  $G$ -Shi Arrangement: Pak-Stanley Labels and Games on Paths, Combinatorics Seminar, Berkeley University, March 20, 2023

Minimum Rank of Regular Bipartite Graphs, Student Mathematics Conference, Moravian College, February 13, 2021

Minimum Rank of Regular Bipartite Graphs, Special Session on Research in Mathematics by Undergraduates and Students in Post-Baccalaureate Programs, Joint Mathematics Meetings, January 7, 2021

Minimum Rank of Regular Bipartite Graphs, Algebraic Combinatorics Session, Canadian Mathematical Society, December 5, 2020

Involution Derangement Graphs, Young Mathematicians Conference, The Ohio State University, August 2020

Involution Derangement Graphs, REU Conference, Clemson University, July 2020

Closed Formulas for Kostant's Partition Function for  $\mathfrak{sl}_4(\mathbb{C})$ , Student Mathematics Conference, Moravian College, February 22, 2020

Geometric Constructions for Lie Algebra Type  $A_3$ , Combinatorial Algebra meets Algebraic Combinatorics Conference, Dalhousie University, January 26, 2020

The  $q$ -analog of Kostant's Weight Multiplicity Formula for  $\mathfrak{sl}_4(\mathbb{C})$ , The Simons Laufer Mathematical Sciences Institute (f.k.a MSRI), July 25, 2019

## CONTRIBUTED CONFERENCE TALKS

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How Many Coin Tosses Would You Need until You Get  $n$  Heads Or  $m$  Tails?, Extremal Combinatorics Contributed Presentation, SIAM Conference on Discrete Mathematics, June 23, 2026

(In Spanish) Parking Functions with a Fixed Set of Lucky Cars, ICMAM Central America and the Caribbean Conference, October 14, 2025

A Symbolic Computational Approach to the Generalized Gambler's Ruin Problem in One Dimension, Numerical Analysis Contributed Presentation, SIAM Annual Meeting, July 29, 2025

From Linear Algebra to Graph Theory: Minimum Rank of Regular Bipartite Graphs, Graphs Contributed Presentation, SIAM Linear Algebra Conference, May 17, 2024

## LOCAL COLLOQUIUM/SEMINAR TALKS

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How Many Coin Tosses Would You Need until You Get  $n$  Heads Or  $m$  Tails?, Experimental Mathematics Seminar, Rutgers University, February 26, 2026

Parking Functions with a Fixed Set of Lucky Cars, Graduate Combinatorics Seminar, Rutgers University, April 9, 2025

A Mirror Step Variant of Gambler's Ruin, Experimental Mathematics Seminar, Rutgers University, February 13, 2025

Simulating the Gambler's Ruin Problem, Graduate Research Café, Rutgers University, January 22, 2025

How can we define prime vector parking functions?, Graduate Combinatorics Seminar, Rutgers University, November 20, 2024

The Chip-firing Game and More, Graduate Pizza Seminar, Rutgers University, November 10, 2023

The  $G$ -Shi Arrangement: Pak-Stanley Labels and Games on Paths, Mathematics Seminar, Stockton University, September 25, 2023

The Chip-firing Game and More, Mathematics Seminar, Stockton University, October 17, 2022

Chromatic Symmetric Function of Trees, Mathematics Seminar, Stockton University, November 30, 2020

Geometric Constructions for Lie Algebra Type  $A_3$ , Mathematics Seminar, Stockton University, March 29, 2020

## NON-RESEARCH PRESENTATIONS

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Mirror, Mirror: A random walk with a twist, Math Circle, Rutgers University, November 20, 2025

Navigating Academia Despite the Obstacles, Our Stories Session, Fourth Annual OURFA<sup>2</sup>M<sup>2</sup> Conference, November 18, 2023

Mentoring Experiences Through the Lens of a Mentee, Critical Issues in Mathematics Education, The Simons Laufer Mathematical Sciences Institute (f.k.a MSRI), March 23, 2023

## POSTER PRESENTATIONS

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Parking Functions with a Fixed Set of Lucky Cars, AWM Research Symposium, May 16, 2025

Weyl Alternation Sets for  $\mathfrak{sl}_4(\mathbb{C})$ , Joint Mathematics Meetings, January 17, 2020

Weyl Alternation Sets for  $\mathfrak{sl}_4(\mathbb{C})$ , SACNAS Conference, November 1, 2019

## RESEARCH AND WORKSHOP PARTICIPATION

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### Research Visits

Collaborate@ICERM, Brown University	January 2026
Women in Noncommutative Algebra and Representation Theory Workshop 4, Banff International Research Station, Canada	March 2025
Mathematical Research Communities, American Mathematical Society	June 2024

### Summer Schools

Applied Math skills Improvement for Grad studies (AMIGAs), IPAM	July 2023
Algebraic Methods in Combinatorics, University of Illinois Urbana-Champaign	June 2023
Graph Coloring, University of Illinois Urbana-Champaign	May 2023

### Workshops

Integrability and Algebraic Combinatorics, IPAM	April 2024
Modern Math Workshop, IMSI	October 2023
Foundations of Computational Mathematics, Sorbonne Université	June 2023
Modern Math Workshop, MSRI	October 2022
Open Problems in Algebraic Combinatorics, UMN Twin Cities	May 2022
The Women of Color Project, Harvard University	October 2020
IMA/Math Alliance Workshop on Career Paths, UMN Twin Cities	July 2020
Modern Math Workshop - MSRI	October 2019

### Programs

Mathematics Outreach Seminar and Training, National Museum of Mathematics, New York City	July 2025
Latinas Achieve in STEM (LaSTEM), Stockton University	February - April 2021
This 7-week program was offered to 5 undergraduate Latinas interested in pursuing careers in STEM. One of the projects included a website that is showcased in the Student Transition Programs.	

## WRITING CONTRIBUTIONS TO THE PROFESSION

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9. Empowering future leaders in Applied Mathematics: The AMIGAs Program. T. Azevedo, D. Beckelhymer, J. Jones, D. Galan Covarrubias, L. Martinez, and A. Singhal. SIAM News Blog, November 3, 2023.
8. AMIGAs' Impact: Computation, collaboration, community ( $C^3$ ). T. Azevedo, D. Beckelhymer, J. Jones, D. Galan Covarrubias, L. Martinez, and A. Singhal. AWM Newsletter, Vol. 53, no. 6, November/December 2023, 25-27.
7. Questions to ask to identify a supportive graduate program as a woman or gender minority in math. B. Gelb, K. Beck, J. Hamlin, H. Mahmoudian, N. Malawo, L. Martinez, and R. Whitman. Math Values. April 12, 2023.

6. A model for a one-hour workshop on mentoring. P. E. Harris, Z. Markman, L. Martinez, A. Mock, E. J. Pabón Cancel, A. Verga, and S. Wang. MAA FOCUS, Vol. 41, no. 1, February/March 2023, 18-21.
5. Ten tips to being productive online for students - and everyone. L. Martinez. Math Values. February 25, 2021.
4. Supporting math majors and grad students in the time of pandemic. P. E. Harris, G. Marquez, and L. Martinez. e-Mentoring Network in the Mathematical Sciences-connecting students and mentors. AMS blogs. January 26, 2021.
3. Networking basics for math undergrads. J. Beckford, A. Christensen, P. E. Harris, L. Martinez, E. Torres Davila, and F. O. Ulysse. e-Mentoring Network in the Mathematical Sciences-connecting students and mentors. AMS blogs. July 21, 2020.
2. Learning during the pandemic: What we wish our professors and mentors knew. M. Cortez, M. Gutierrez, P. E. Harris, B. Keene-Gomez, L. Martinez, A. Minino, A. Prieto Langarica, K. Tesfaye, and S. e-Mentoring Network in the Mathematical Sciences-connecting students and mentors. AMS blogs. May 04, 2020.
1. Bank of REU/Grad fair questions. L. Martinez and E. Torres Davila. e-Mentoring Network in the Mathematical Sciences-connecting students and mentors. AMS blogs. January 24, 2019.

## PROFESSIONAL DEVELOPMENT

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### Workshop Leader

How to Create your Professional Website	
AWM Chapter, Rutgers University	March 2025
The University of Puerto Rico at Ponce	July 2024
CV Writing Workshop	
AWM Chapter, Rutgers University	November 2024/December 2025
The University of Puerto Rico at Ponce	July 2024

### Panelist

Undergraduate and Graduate Students, IGEN-Math	February 2025
Online Fall Graduate School fair Kickoff Panel, AMS	October 2024
Current and Recent Graduate Student Perspectives, GROW Conference	September 2024
Stockton University Alumni Panel	September 2024
Funding and Fellowships Panel, The Women+ of Color Project	October 2022
Graduate School Panel, Summer@ICERM	June 2022
Undergraduate Research Student Panel, CURM	June 2022
Beginning Undergraduates' Mathematical research Preparation Panel, YSU	May 2022
Student Panel, IMA/Math Alliance Workshop, University of Minnesota	July 2020
Educational Opportunity Fund, Stockton University	July 2020

## SERVICE AND OUTREACH

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### Co-organizer

Undergraduate Special Session, AWM Research Symposium	May 2025
Experimental Mathematics Seminar, Rutgers University	Fall 2024 - Present
EDGE Webinar Series, EDGE Foundation	Fall 2023 - Present

<b>Co-founder</b> of the EDGE Webinar Series, EDGE Foundation	2023
<b>Member</b> of Department of Mathematics Climate Committee, Rutgers University	2023 - 2024
<b>Facilitator</b> , Cafe Con Leche, Research Talk hosted by Lathisms	March 2022
<b>Co-founder and Co-president</b> of the Stockton University AWM Chapter	2020 - 2021
<b>Volunteer</b>	

Homework Completion Program, Atlantic City Library, NJ	March 2020
Networking/Speaker Series, Summer Math and Science Honors Academy	July 2019/2020

<b>Proctor</b> , High School Math Mayhem Competition, Stockton University	April 2019
<b>Service-Learning Coordinator</b> of the Alliance of EOF Students of NJ	2019 - 2020
<b>Referee</b> for Experimental Mathematics, PUMP Journal of Undergraduate Research	

## MEMBERSHIPS

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Society for Industrial and Applied Mathematics	Jan. 2024 - Dec. 2025
American Mathematical Society	Oct. 2021 - Dec. 2025
Association for Women in Mathematics	July 2020 - July 2021
American Statistical Association	Nov. 2019 - Nov. 2020
Pi Mu Epsilon (Member, 2019-2020 Secretary)	Sept. 2019 - May 2021
Advancement of Chicanos/Hispanics and Native Americans in Science	July 2019 - July 2024

## SKILLS

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### Technology

Proficient in  $\text{\LaTeX}$ , Sage, Maple and CoCalc. Some experience with HTML, Java and Python.

### Other

Fluent in English and Spanish, both written and verbal.