

RAUL MARQUEZ III

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<https://www.raulmarqueziiii.com>

EDUCATION

University of Texas Rio Grande Valley

Edinburg, Texas

M.S. Mathematics, Thesis Track

2025 - 2027 (*expected*)

- GPA: 4.00/4.00
- Advisor: Prof. Alexey Glazyrin
- Research area: Combinatorics in Extremal Set Problems
- Coursework: Algebra I, Complex Analysis, Partial Differential Equations, Probability and Statistics

University of Texas Rio Grande Valley

Edinburg, Texas

B.S. Mathematics, Concentration in Pure Mathematics, Minor in Physics

2023 - 2025

- GPA: 4.00/4.00
- Coursework: Number Theory, Real Analysis I & II, Complex Variables, Modern Algebra I, Galois Theory

South Texas College

McAllen, Texas

A.S. in Mathematics

2020 - 2023

- GPA: 4.00/4.00
- Coursework: Calculus III, Differential Equations, Linear Algebra

PUBLICATIONS

1. Arora, Palak & Bruda, Glenn & Fang, Bruce & **Marquez, Raul** & Miller, Steven & Prapashtica, Beni & Sharan, Vismay & Son, Daeyoung & Tang, Xueying & Waheed, Saad. (2025). Upper Bounds for the Lowest First Zero in Families of Cuspidal Newforms. *Journal of Number Theory*. 277. 10.1016/j.jnt.2025.02.012.
2. Bruda, Glenn & Cooper, Joseph & Jaber, Kareem & **Marquez, Raul** & Miller, Steven. (2024). Variants of Conway Checkers and k-nacci Jumping. 10.48550/arXiv.2408.08856.
3. Bruda, Glenn & Fang, Bruce & Gilman, Pico & **Marquez, Raul** & Miller, Steven & Prapashtica, Beni & Son, Daeyoung & Waheed, Saad & Wang, Janine. (2024). Stability of Matrix Recurrence Relations. 10.48550/arXiv.2408.12660.
4. Bruda, Glenn & Fang, Bruce & **Marquez, Raul** & Miller, Steven & Prapashtica, Beni & Sharan, Vismay & Son, Daeyoung & Waheed, Saad & Wang, Janine. (2025). The Limiting Spectral Distribution of Various Matrix Ensembles Under the Anticommutator Operation. 10.48550/arXiv.2502.00505.
5. Cashman, Caroline & Cooper, Joseph & **Marquez, Raul** & Miller, Steven & Shuffleton, Jenna. (2024). Hyper-bishops, Hyper-rooks, and Hyper-queens: Percentage of Safe Squares on Higher Dimensional Chess Boards. 10.48550/arXiv.2409.04423.

TALKS

1. Bruda, Glenn & **Marquez, Raul**. Upper Bounds for the Lowest First Zero in Families of Cuspidal Newforms. University of North Texas. *37th Automorphic Forms Workshop*. May 3, 2025.
2. **Marquez, Raul**. Upper Bounds for the Lowest First Zero in Families of Cuspidal Newforms. Prairie View Texas A&M. *104th Annual Meeting of the Texas Section of the Mathematical Association of America*. March 29, 2025.
3. **Marquez, Raul**. Elliptic Curves: Understanding Their Significance and the Point Addition Operation. Stephen F. Austin University. *18th Texas Undergraduate Mathematics Conference*. October 28, 2023.

RESEARCH
EXPERIENCE

Graduate Research Assistantship / Undergraduate Researcher

UTRGV College of Mathematical and Statistical Sciences February 15, 2025 – Present

- Analyzed problems in extremal set theory to minimize distance sets in Hamming and Johnson Spaces
- Coded on several projects to incorporate the programs and theorems to further progress within the project
- Corresponded with other participants in a variety of projects and works to analyze solutions to research problems and develop papers intended for publication

Chief of Staff / Researcher

Williams College SMALL REU Program

June 10, 2024 - August 10, 2024

- Worked with main program advisor to coordinate the official duties of important processes within the program
- Analyzed several problems within the field of mathematics concerning L-Functions, Fibonacci Sequences, Elliptic Curves, and Random Matrix Theory
- Corresponded with other participants in a variety of projects and works to analyze solutions to research problems and develop papers intended for publication

WORK
EXPERIENCE

Academic Tutor

UTRGV Mathematics and Science Academy

September 3, 2024 – December 15, 2024

- Educated several students on college-level proof-based mathematics on homework assignments, test preparation, and study habits
- Coordinated with tutors and faculty to ensure a cooperative learning for high school students of all backgrounds to have a fruitful learning experience

Academic Tutor

UTRGV College Assistance Migrant Program

August 28, 2023 – December 18, 2023

- Educated several students personally and devised specific solutions to learning needs and requirements for undergraduate work in mathematics, sciences, and history
- Corresponded with tutors, mentors, and managers to devise the most effective solutions for students in different areas of education and their personal issues
- Facilitated healthy learning environment crucial for first-generation and migrant students to thrive in several scenarios and take advantage of their educational opportunities

LEADERSHIP &
ACTIVITIES

President

UTRGV Mathematical Society

August 28, 2023 - Present

- Tutored oncoming students on problems concerning undergraduate-level work
- Organized events, meetings, fundraising to improve the club's funds and spread mathematics
- Communicated with corresponding members on fundraising events, organizing mathematics competitions, and designing the website
- Attended several mathematics-related lectures, presentations, and conferences outside of undergraduate work and class concerning a variety of topics in applied and pure mathematics

Volunteer

South Texas Astronomical Society

July 20, 2023 - Present

- Promoted astronomical activities and science awareness in the Rio Grande Valley towards the general community
- Organized public events and cooperated with members to promote the organization's goals

SEMINARS AND READING PROGRAMS	Preliminary Arizona Winter School (PAWS)	Online Synchronous
	<i>University of Arizona</i>	Fall 2024, Fall 2025
	<ul style="list-style-type: none"> Projects: Root Systems w/ Professor Melissa Emory, Analysis and implementation of algorithms in number theory w/ Juanita Duque-Rosero 	
	Directed Reading Program	Online Synchronous
	<i>University of Texas</i>	Summer 2025
	<ul style="list-style-type: none"> Projects: Algebraic Topology w/ Abhishek Shivkumar 	
	Elliptic Curves Seminar	Edinburg, Texas
	<i>University of Texas Rio Grande Valley</i>	Fall 2024
	<ul style="list-style-type: none"> Projects: Basics of Elliptic Curves w/ Debanjana Kundu 	
AWARDS AND HONORS	<ul style="list-style-type: none"> • UTRGV Math Society Outstanding Overall Undergraduate, 	May 2025
	<ul style="list-style-type: none"> • NSF S-STEM Mathematics Graduate Scholarship, 	January 2025
	<ul style="list-style-type: none"> • Fall 2024 UTRGV Open Mathematics Competition Winner, 	May 2024
	<ul style="list-style-type: none"> • Leona B. Cameron Scholarship in Math, 	May 2024
	<ul style="list-style-type: none"> • Keppel Am-Fels Scholarship, 	May 2024
	<ul style="list-style-type: none"> • UTRGV Math Society Outstanding Undergraduate Performance, 	May 2024
	<ul style="list-style-type: none"> • Top UTRGV Putnam Scorer, 	2023,2024
	<ul style="list-style-type: none"> • UTRGV Presidential List, 	January 2024 - Present
	<ul style="list-style-type: none"> • Presidential Scholarship, 	May 2023
	<ul style="list-style-type: none"> • Engineering Design and Development People's Choice Award, 	May 2023
SKILLS AND INTERESTS	Skills: Leadership, Communication, Teamwork, Problem-Solving, Writing, and Rhetoric.	
	Interests: Mathematics, Physics, Engineering, Politics, Writing, and Music	
	Programming: Python, C++, Java, G-Code, MATLAB.	