

ALEC S. ZABEL-MENA

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EDUCATION

Universtiy of Puerto Rico, at Río Piedras
Master of Science in Pure Mathematics

August 2022 – December 2025 (Expected)

Universtiy of Puerto Rico, at Río Piedras
Bachelor of Science in Pure Mathematics
Minor in Cybersecurity

August 2016 – June 2022

CAREER OBJECTIVE

To become an academic researcher and professor. Aiming to research both pure and applied mathematics; specifically research in algebraic geometry, coding theory, and other areas of discrete mathematics.

RESEARCH INTERESTS

- Commutative Algebra
- Algebraic Geometry
- Finite Fields
- Graph theory, and Combinatorics
- Matroid theory
- Category Theory and Type Theory

PUBLICATIONS

1. Agrinoni, C.A., Janwa, H., Zabel-Mena, A.S. *Absolute Irreducibility of Generalized Trinomials Defined by APN Functions of The Form $g(x) = 2^{2^e} + h(x)$ over \mathbb{F}_{2^s}* . Springer Proceedings in Mathematics & Statistics, (To be submitted). 2025.

TALKS, SEMINARS, AND COLLOQUIUMS

1. Zabel-Mena, A.S., Janwa, H. Agrinoni, C.A. *Absolute Irreducibility of Generalized Trinomials Defined by APN Functions of The Form $g(x) = 2^i + h(x)$ over \mathbb{F}_{2^s}* (Contributed Talk). 56th Southeastern International Conference on Combinatorics, Graph Theory, & Computing (SEICCGTC), Boca Raton, Florida. 2025.
2. Zabel-Mena, A.S., Janwa, H. Agrinoni, C.A. *Absolute Irreducibility of Generalized Trinomials Defined by APN Functions of The Form $g(x) = 2^i + h(x)$ over \mathbb{F}_{2^s}* (Contributed Talk). 40th Seminario Interuniversitario de Investigación en Ciencias Matemáticas (SIDIM), Ponce P.R. 2025.
3. Zabel-Mena, A.S., Janwa, H. Agrinoni, C.A. *An Efficient Implementation and Analysis Of Zeta Functions Of APN Curves and Their Protograph LDPC Codes* (Contributed Talk). 39th Seminario Interuniversitario de Investigación en Ciencias Matemáticas (SIDIM), Humacao P.R. 2024.
4. Zabel-Mena, A.S., Janwa, H. Agrinoni, C.A. *An Efficient Implementation and Analysis Of Zeta Functions Of APN Curves and Their Protograph LDPC Codes* (Poster Session). Forward Research and Innovation Summit, San Juan P.R. 2023.

GRANTS AND AWARDS

PR Space Grant Fellowship and Scholarship Program, NASA
Grant No. 80NSSC20M0052

August 2024 – May 2025

Research Assitanship, NASA
Grant No. 80NSSC20M0052

January 2024 – May 2024

Research Assitanship, NASA
Grant No. 80NSSC20M0052

August 2023 – December 2023

TEACHING

Proyecto Tutorías DECEP University of Puerto Rico, Río Piedras Mathematics tutor	2020-2021
Conducted assessments to identify the educational needs of my students and developed individualized learning plans.	
Tasked with providing tutoring services to seven high school students for 10 hours a week in the subjects of Algebra and Pre-Calculus.	
Self-Employed Mathematics tutor	2019-2021
Evaluated students learning styles and provided appropriate techniques for maximizing understanding and minimizing frustration.	
Simplified math concepts while coaching students to think critically when problem solving; eventually introducing them to axiomatic systems within mathematics.	
Provided tutoring one-on-one to five highschool students in the subjects of Algebra, Pre-Calculus, and Geometry for two times a week, at two hours for each session.	

AFFILIATIONS

Consejo General de Estudiantes (UPRRP) Representante ante el Consejo de Estudios Graduados e Investigación	August 2024 – May 2025
Consejo de Estudiantes de Ciencias Naturales (UPRRP) Representante ante el Decanato de Estudios Graduados e Investigación	August 2024 – May 2025
Asociación Estudiantil de Matemáticas (AeMAT) Treasurer Post yet to be assumed.	2019 – Present August 2025 – May 2026
Treasurer	August 2022 – May 2024
Asociación de Estudiantes de Ciencias de Computos (AECC)	2019 – Present
Lembrança Negra Capoeira Corda Crua-Verde	2017 – 2019
Senzala Capoeira (Sou Capoeira) Corda Crua-Laranja	2019 – Present
CEO of HTMX CEO	2023 – Present

SKILLS

Languages

English
Spanish
Portuguese

Software

L^AT_EX

C programming

SAGE Mathematics Software

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