Eric J. Pabón-Cancel

Curriculum Vitae

eric(dot)pabon1(at)upr(dot)edu // Webpage: ejpaboncancel.github.io // (939)-260-8406 // U.S. Citizen

---

Education

University of Puerto Rico, Mayagüez Campus   **Mayagüez, PR**
Bachelor of Science in Pure Mathematics   May 2023
Curricular Sequence in Applied Mathematics
General GPA: 3.55 // 4.00 // Major GPA: 3.55 // 4.00

Courses

Foundations of Mathematics, Intro. to Algebraic Structures, Differential Equations, Partial Differential Equations, Computer Programming I, Complex Variables, Mathematical Statistics I, Foundations of Mathematical Logic, Advanced Calculus I & II, Numerical Analysis I, Point-Set Topology, Linear Algebra (Intermediate/Graduate), Number Theory I (Graduate)

Skills

Software: C++ (Intermediate), MATLAB (Beginner), SAGEMath (Intermediate), LaTeX (Advanced)
Languages: Spanish (Native), English (Fluent)

Research Experience

Undergraduate Research in Pure Mathematics at UPRM   **Mayagüez, PR**
Properties of $\tau_{(n)}$-primes   August 2022 - May 2023
Advisor: Reyes M. Ortiz-Albino // Participants: Eric J. Pabón-Cancel

- Development of more theorems related to the distribution of the $\tau_{(n)}$-primes. Exploration of these elements with algebraic and analytic strategies. Formal approach for the symmetric behavior related to the distribution of the $\tau_{(n)}$-primes modulo a $\tau_{(n)}$-prime.

The Study of $\tau_{(n)}$-primes   August 2021 - May 2022
Advisor: Reyes M. Ortiz-Albino // Participants: Eric J. Pabón-Cancel

- Continuation of the study of $\tau_{(n)}$-prime elements, in particular the investigation of properties for other values of n. Developed a theorem related to Euler's totient function and other lemmas related to prime distribution. Computational results made us speculate a symmetric behavior in the distribution of the elements in each equivalence class modulo a $\tau_{(n)}$-prime.

The Study of $\tau_{(n)}$-atoms   August 2019 - May 2020
Advisor: Reyes M. Ortiz-Albino // Participants: Eric J. Pabón-Cancel

- Project based on Number Theory and Algebra with the purpose to characterize the properties and distribution of the $\tau_{(n)}$-atoms and $\tau_{(n)}$-primes. We characterized the distribution of $\tau_{(2)}$-primes and $\tau_{(3)}$-primes. This characterization led to generalizations of known results in the elementary theory.

Summer@ICERM 2022: Computational Combinatorics   **Providence, RI**
Toward a Characterization of Invariant Parking Sequences   June 2022 - August 2022
Advisor: Pamela E. Harris // Participants: Douglas Chen, Gabriel Sargent, Eric J. Pabón-Cancel

- Computational Combinatorics project, focused on the study of Permutation Invariant Parking Sequences. We developed the sufficient conditions for a preference sequence $\vec{x}$ to be a parking sequence. We also characterized when the car length vector y is minimally invariant (when (1^n) is the only invariant parking sequence), and characterized the form of the 2-tuple parking sequences and 3-tuple parking sequences. We have considered to explore the project in the branch of Theoretical Computer Science, since we have the speculation that a complete characterization for parking sequences may be an NP-Complete problem.

NSF-REU in Probability, Combinatorics and Coding Theory   **Johnson City, TN**
Improving Bounds of Hermitian-Lifted Codes with their Automorphism Group   June 2021 - August 2021
Advisor: Fernando Piñero // Participants: Lesley Polanco, Eric J. Pabón-Cancel

- Algebraic Geometry Coding Theory project focused on the development of locally recoverable codes from elements that arise from regions of the normal basis of the Hermitian Curve. We used the Automorphism Group to characterize the monomials that reduce nice to improve the bound of the codes. We improved the counting of good functions that have a nice reduction.

Improving the Minimum Distance Bound of Trace Goppa Codes   June 2021 - August 2021
Advisor: Fernando Piñero // Participants: I. Byrne, N. Dodson, R. Lynch, E.J. Pabón-Cancel

- Finite Fields Coding Theory project focused on the development of codes using Goppa matrices and polynomials. Development of codes using the trace and norm over a finite field using quadratic extensions and cubic extensions. We improved the minimum distance bound of trace Goppa Polynomials, and permuted trace Goppa Polynomials.

Papers and Articles

1. Pabón, Eric, Oriz-Albino, Reyes. "The Study of $\tau_{(n)}$-primes". (In progress).

2. Chen, Douglas et. al. "Toward a Characterization of Invariant Parking Sequences". (Editing for submission).

3. Allen, Austin, et. al. "Improving Bounds of Hermitian-Lifted Codes". (Editing for submission).

4. Byrne, Isabel, et al. "Improving the Minimum Distance Bound of Trace Goppa Codes". *ArXiv.org*, ArXiv.org, 17 Jan. 2022, https://arxiv.org/abs/2201.03741. (Submitted).

Writings and Contributions

1. A how to guide to a one-hour workshop on mentoring, with Pamela E. Harris, Zoe Markman, Lucy Martinez, Ava Mock, Eric J. Pabón Cancel, Amanda Verga, and Susan Wang. (Submitted).

Presentations

1. **SACNAS NDiSTEM Conference** (Upcoming)   **San Juan, PR**
   The Study of $\tau_{(n)}$-primes Project Poster   October 2022

2. **Summer@ICERM 2022: Computational Combinatorics**   **Providence, RI**
   On Permutation-Invariant Parking Sequences Presentation   August 2022

3. **2022 JTM-PRISM**   **Humacao, PR**
   The Study of $\tau_{(n)}$-primes Project Presentation   April 2022

4. **Joint Mathematics Meetings 2022**   **Virtual Presentation**
   Improving Bounds of Hermitian-Lifted Codes Project Poster   April 2022

5. **37th SIDIM**   **Virtual Presentation**
   Improving Bounds of Hermitian-Lifted Codes Presentation   February 2022
   The Study of $\tau_{(n)}$-primes Project Poster

6. **2021 Math REU Conference @ Clemson University**   **Virtual Presentation**
   Improved Hermitian-Lifted Codes Presentation   July 2021

7. **2021 JTM-PRISM**   **Virtual Presentation**
   The Study of $\tau_{(n)}$-atoms Presentation   April 2021

8. **35th SIDIM** **Cayey, PR**
   The Study of $\tau_{(n)}$-atoms Project Poster March 2020

Conferences

1. 2022 Field of Dreams Conference (Upcoming) 4-6 November, 2022
   The Graduate Hotel, Minneapolis, Minnesota

2. SACNAS National Diversity in STEM Conference (Upcoming) 27-29 October 2022
   Pedro Roselló Convention Center, San Juan, Puerto Rico

3. 2022 Junior Technical Meeting - PR Interdisciplinary Scientific Meeting 9 April, 2022
   University of Puerto Rico at Humacao, Humacao, Puerto Rico

4. Joint Mathematics Meetings 2022 6-9 April, 2022
   Zoom Conference

5. 37th Interuniversity Mathematical Sciences Research Seminar 25-26 February, 2022
   Zoom Conference, sponsored by University of Puerto Rico, Mayagüez Campus

6. 2021 Math REU Conference @ Clemson University 19 July, 2021
   Zoom Conference. Participanting Institutions:
   Clemson University, East Tennessee State University, North Carolina A&T, Elon University

7. 2021 Junior Technical Meeting - PR Interdisciplinary Scientific Meeting 23-24 April, 2021
   Virtual Conference, sponsored by Puerto Rico Louis Stokes Alliance for Minority Participation

8. 35th Interuniversity Mathematical Sciences Research Seminar 6-7 March, 2020
   University of Puerto Rico at Cayey, Cayey, Puerto Rico

Workshops
MSRI Modern Math Workshop 2022 **San Juan, PR**
Topics: Mathematical Modeling and Data Science (Upcoming) October 2022
Organizers: Hélene Barcelo (MSRI), Christian Ratsch (IPAM), Ulrica Wilson (ICERM)

- Mathematical workshop for networking with the math community, sponsored by the Mathematical Sciences Research Institute, Institute for Pure and Applied Mathematics (University of California, Los Angeles), and the Institute for Computational and Experimental Research in Mathematics (Brown University).

Thematic Program in p-adic L-functions and Eigenvarieties **Notre Dame, IN**
Topics: Modular Forms and Elliptic Curves Summer 2022
Organizers: Andrei Jorza, Claudiu Raicu, Evan O'Dorney (University of Notre Dame)

- Undergraduate Summer School in Modular Forms. A problem-solving introduction to modular forms and elliptic curves. Received mini-courses in Algebraic Geometry, Elliptic Geometry, and Modular Forms, unified these fields, and developed the bridge between Number Theory and Complex Analysis. This workshop was hosted by the Center for Mathematics at the University of Notre Dame with support from the NSF.

2022 NSF/STEM: Fellowships Application Workshop **Rio Piedras, PR**
Topics: Grants and Fellowships Workshop May 2022
Organizers: Mike Westrate (Villanova University)

- Multi-day Professional Development and Grant-Writing Workshop. Intensive training in the theory and practice of research project design, grant development, and writing successful grant and fellowship proposals. Detailed training on NSF review criteria, Intellectual Merit and Broader Impacts.

Algebraic Coding Theory Workshop **Johnson City, TN**

Topics: Finite Fields and Projective Geometry Summer 2021

Organizer: Fernando Piñero (University of Puerto Rico at Ponce)

- Coding theory workshop, presented by Prof. Fernando Piñero at East Tennessee State University to introduce students to the fundamental notions of finite fields and projective geometry. We learned how to construct a finite field, and got an introduction to visualization of algebraic objects in the projective plane.

Awards and Merits

National Math Alliance F-GAP Program Scholar	August 2022 -present
Hispanic Scholarship Fund Scholar	June 2022 - present
National Math Alliance Predoctoral Scholar	November 2021 - present
Faculty of Arts and Sciences Honor Roll	August 2018 - present
PR-Louis Stokes Alliance for Minority Participation Scholar	August 2019 - 2022
Society of Physics Students Freshman of the year	August 2018 - May 2019
National Trig-Star Math Competition 16th Overall State Finalist	June 2017
Eagle Scout Rank, Scouts BSA, Boy Scouts of America	May 2017

Scholarships and Fellowships

2021-2022 PR-LSAMP Scholarship	Amount: $1,600.00
UPRM Musical Talent Scholarship (Second Semester 2020)	Amount: $800.00
2019-2020 PR-LSAMP Scholarship	Amount: $1,600.00

Professional Memberships

Society for Advancing Chicanos/Hispanics and Native Americans in Science Member
National Eagle Scout Association Member

Student Associations

PythagoRUM **Mayagüez, PR**

Co-founder & Vice-President August 2022 - present

- Served as co-founder and currently serving as Vice-President for the mathematics and computer science student association. This entity has the purpose to promote research in the branches of mathematics, as well as related fields of STEM, through professional development workshops, research colloquia and other activities.

Society of Physics Students, UPRM Chapter **Mayagüez, PR**

Committee Assistant August 2018 - May 2020

- Served as a Demonstration Committee assistant in 2 physics phenomena presentations. These presentations were general physics demonstrations related to the concepts of conservation of momentum and torque. The presentations were for an audience of elementary school students to motivate them to study science. Served as a Sales Committee assistant in multiple chapter food sales events in order to improve the chapter's office.

Leadership Experience and Development

Fundación Yo Puedo, Inc. **Manatí, PR**

Roles and Activities January 2016 - present

- Participated in weekly activities providing food and clothing to the poor people in Manatí, Puerto Rico. Created an initiative of knit hats for children suffering from cancer. Recruited 7 classmates for one event.

Boy Scouts of America, Troop 24   **Barceloneta, PR**
National Youth Leadership Training-2-2017   October 2018 - November 2018

- Boy Scout course for training youth to overcome themselves and become leaders in their troop and community. Participated as a Troop Guide and gave six lectures about leadership to a patrol of 7 people, serving as the Troop Guide of the patrol.

Order of the Arrow, Yokahu Lodge 506   Summer 2018 - Summer 2019

- Served as counselor for the youth in two Order of the Arrow camps. Served as secretary for the Order of The Arrow Arasibo district, managing to recruit 5 new member candidates in the summer of 2018. Mentored these candidates to be initiated as new members for the Camping Honor Society.

Boy Scouts of America, Troop 858   **Vega Baja, PR**
National Youth Leadership Training-1-2017   June 2017

- Served as Troop Guide for a patrol of 6 people in the National Youth Leadership Training Scout Course in the Guajataka Scout Reservation. Gave six main patrol lectures about leadership and motivation. Gave a servant leadership conference to an audience of 60+ scout youth.

Eagle Scout Service Project   March 2017 - May 2017

- Earned the Eagle Scout rank, the highest honor a Scout can achieve, by developing the Eagle Scout Service Project with the purpose to benefit the community. The project was at an outdoor gym and park, and was able to build a 10ft by 10ft gazebo and painted it, built two benches and painted them, painted the park's swings and marked a gravel path for jogging at the gym. Recruited 30+ people to run the project properly.

Juan Quirindongo Morell High School   **Vega Baja, PR**
Roles and Achievements   August 2015 - June 2018

- Leader of the school math club, providing guidance to 5+ students interested in mathematical competitions. Qualified for the Puerto Rico Math Olympiad in the Region of Arecibo for 3 consecutive years, and resulted as the 16th finalist representing Puerto Rico on the 2017 National Trig Star Competition, sponsored by the National Society of Professional Surveyors.

Extracurricular Activities
Acting   **Mayagüez, PR**
Theater Presentations and Roles   March 2019 - present

- The Physics Movie (Nicholas Flamel, secondary character) (In Development)

- El Muerto (Sabás Honoré, secondary character) (August 2019)

- The Physics Show (Michael Faraday, secondary character) (March 2019)

Alma Latina UPRM Music Group   **Mayagüez, PR**
Staff & Musician   February 2020 - March 2020

- Worked as percussion musician and staff for the Latin jazz and salsa music group Alma Latina at UPRM.