

Eric J. Pabón Cancel

Curriculum Vitae

epabonca@purdue.edu
[ejpaboncancel.github.io](https://github.com/ejpaboncancel)



EDUCATION	Doctor of Philosophy in Mathematics	Starting August 2023
	Purdue University , West Lafayette, Indiana	
	Bachelor of Science in Pure Mathematics (<i>Magna Cum Laude</i>) Curricular Sequence in Applied Mathematics for Science and Engineering University of Puerto Rico, Mayagüez Campus (UPRM) , Mayagüez, Puerto Rico	June 2023
RESEARCH EXPERIENCE	High School Diploma (<i>Highest Honors</i>) Juan Quirindongo Morell High School, Vega Baja, Puerto Rico	June 2019
	Research in Machine Learning	May 2023–August 2023
	Program: GEM Fellowship Employer Sponsor Internship Group 39, Division 3, MIT Lincoln Laboratory , Massachusetts Institute of Technology Supervised by: Dr. Sam Polk & Dr. Mabel Ramírez, MIT Lincoln Laboratory Title: <i>Unsupervised Machine Learning through Autoencoders with LSTM architecture</i> <ul style="list-style-type: none">Research focused on Long Short-Term Memory Autoencoders and mathematical algorithms, with the aim to minimize the loss function of the optimal autoencoder.	
	Research in Number Theory	August 2019–December 2022
	Program: Puerto Rico Louis Stokes Alliance for Minority Participation University of Puerto Rico, Mayagüez Campus, Department of Mathematical Sciences Supervised by: Prof. Reyes M. Ortiz Albino, University of Puerto Rico at Mayagüez Title: <i>Properties of $\tau_{(n)}$-primes</i> <ul style="list-style-type: none">Research project based on the theory of generalized factorizations. Generalized the notion of complete residue systems for $\tau_{(2)}$-primes, $\tau_{(3)}$-primes and $\tau_{(6)}$-primes. Developed an extension of Euler's totient function.	
	Research in Combinatorics	June 2022–August 2022
	Program: Summer@ICERM 2022: Computational Combinatorics Institute for Computational and Experimental Research in Mathematics , Brown University Supervised by: Prof. Pamela E. Harris, University of Wisconsin-Milwaukee Title: <i>Permutation Invariant Parking Assortments</i> <ul style="list-style-type: none">Research project focused on the study of Permutation Invariant Parking Sequences. Characterized when the car length vector \vec{y} is minimally invariant (when (1^n) is the only invariant parking sequence), and characterized the form of the 2-tuple and 3-tuple parking sequences.	
	Research in Algebraic Coding Theory	June 2021–August 2021
	Program: NSF REU in Combinatorics, Probability and Algebraic Coding Theory East Tennessee State University & University of Puerto Rico at Ponce Supervised by: Prof. Fernando Piñero González, University of Puerto Rico at Ponce Title: <i>Improving the Dimension Bound of Hermitian-Lifted Codes</i> <ul style="list-style-type: none">Algebraic Geometry project focused on locally recoverable codes from elements that arise from regions of the normal basis of the Hermitian Curve. Developed a formula that improved the counting of good recoverable functions. Improved the bound rate of the code from 0.7% to 10%.	
	Title: <i>Improving the Minimum Distance Bound of Trace Goppa Codes</i> <ul style="list-style-type: none">Finite Fields project focused on the development of codes using Goppa matrices by using quadratic extensions and cubic extensions over finite fields. Improved the minimum distance bound of trace Goppa Polynomials.	

SCHOLARSHIPS AND FELLOWSHIPS	2023 National GEM Consortium PhD Science Fellowship, \$16,000	August 2023–May 2024
	• Purdue University Department of Mathematics Sponsorship, \$11,700	August 2023–May 2024
	• MIT Lincoln Laboratory Employer Sponsorship	
	2022 Evertec Inc. Scholarship, \$1,000.00	October 2022
	Puerto Rico-LSAMP Scholarship, \$4,800.00	August 2019–December 2022
	UPRM Musical Talent Scholarship, \$800.00	February 2020
TRAVEL FUNDING	2023 Emerging Researchers National Conference in STEM Travel Grant	February 2023
	2022 Field of Dreams Math Alliance Conference Travel Scholarship	November 2022
	2022 Puerto Rico-LSAMP Travel Grant	October 2022
AWARDS AND MERITS	2023 Ford Foundation Predoctoral Fellowship Honorable Mention	March 2023
	2022 Hispanic Scholarship Fund Scholar	June 2022
	National Math Alliance Predoctoral Scholar	November 2021–May 2023
	UPRM Faculty of Arts and Sciences Honor Roll	August 2018–May 2023
	National Trig-Star Math Competition, 16th Overall Finalist	June 2017
	Eagle Scout Rank, with 2 Silver Palms	May 2017
PREPRINTS AND PAPERS	[1] <u>E.J. Pabon-Cancel</u> and R.M. Ortiz-Albino. Properties of $\tau_{(n)}$ -primes. (In progress).	
	[2] A. Allen, <u>E.J. Pabon-Cancel</u> , L. Polanco and F. Piñero-Gonzalez. Improving the Dimension Bound of Hermitian-Lifted Codes. <i>Submitted to Designs, Codes and Cryptography</i> . arXiv: https://arxiv.org/abs/2302.01557 .	
	[3] D. Chen, P.E. Harris, J. Carlos Martinez Mori, <u>E.J. Pabon-Cancel</u> and G. Sargent. Permutation Invariant Parking Assortments. <i>Submitted to Enumerative Combinatorics and Applications</i> . arXiv: https://arxiv.org/abs/2211.01063 .	
	[4] I. Byrne, N. Dodson, R. Lynch, <u>E.J. Pabon-Cancel</u> and F. Piñero-Gonzalez. Improving the minimum Distance bound of Trace Goppa codes. <i>Designs, Codes and Cryptography</i> . (2023). DOI: https://doi.org/10.1007/s10623-023-01216-6 arXiv: https://arxiv.org/abs/2201.03741 .	
CONTRIBUTIONS TO THE PROFESSION	[1] P.E. Harris, Z. Markman, L. Martinez, A. Mock, <u>E.J. Pabón-Cancel</u> , A. Verga, and S. Wang. A Model for a One-Hour Workshop on Mentoring. <i>MAA Focus</i> , 43(1):18-21, 2023.	
PRESENTATIONS		
	• 2023 JTM-PRISM <i>Properties of $\tau_{(n)}$-primes</i>	Bayamón, PR April 2023
	• 38th Interuniversity Mathematical Sciences Research Seminar <i>Permutation Invariant Parking Assortments Presentation</i>	Mayagüez, PR February 2023
	• 2023 AAAS Emerging Researchers National Conference in STEM <i>Permutation Invariant Parking Functions with cars of assorted lengths Poster</i>	Washington, DC February 2023
	• Joint Mathematics Meetings 2023 <i>Permutation Invariant Parking Functions with cars of assorted lengths Poster</i> <i>Permutation Invariant Parking Functions with Cars of Arbitrary Lengths Presentation</i>	Boston, MA January 2023
	• 2022 SACNAS National Diversity in STEM Conference <i>The Study of $\tau_{(n)}$-primes Poster</i>	San Juan, PR October 2022

- **2022 Gulf Coast Undergraduate Research Symposium** **Houston, TX**
Properties of $\tau_{(n)}$ -primes Presentation October 2022
- **Summer@ICERM 2022: Computational Combinatorics** **Providence, RI**
On Permutation-Invariant Parking Sequences Presentation August 2022
- **2022 JTM-PRISM** **Humacao, PR**
The Study of $\tau_{(n)}$ -primes Presentation April 2022
- **Joint Mathematics Meetings 2022** **Virtual Presentation**
Improving Bounds of Hermitian-Lifted Codes Poster April 2022
- **37th Interuniversity Mathematical Sciences Research Seminar** **Virtual Presentation**
Improving Bounds of Hermitian-Lifted Codes Presentation February 2022
The Study of $\tau_{(n)}$ -primes Poster
- **2021 Math REU Conference@Clemson University** **Virtual Presentation**
Improved Hermitian-Lifted Codes Presentation July 2021
- **2021 JTM-PRISM** **Virtual Presentation**
The Study of $\tau_{(n)}$ -atoms Presentation April 2021
- **35th Interuniversity Mathematical Sciences Research Seminar** **Cayey, PR**
The Study of $\tau_{(n)}$ -atoms Poster March 2020

CONFERENCES

- 2023 Junior Technical Meeting-PR Interdisciplinary Scientific Meeting 29 April, 2023
University of Puerto Rico at Bayamón Bayamón, Puerto Rico
- 38th Interuniversity Mathematical Sciences Research Seminar 24-25 February, 2023
University of Puerto Rico, Mayagüez Campus Mayagüez, Puerto Rico
- 2023 AAAS Emerging Researchers National Conference in STEM 9-11 February, 2023
Omni Shoreham Hotel Washington, District of Columbia
- Joint Mathematics Meetings 2023 4-7 January, 2023
John B. Hynes Veterans Memorial Convention Center Boston, Massachusetts
- 2022 Field of Dreams Conference of The National Math Alliance 4-6 November, 2022
The University of Minnesota-Twin Cities Minneapolis, Minnesota
- 2022 SACNAS National Diversity in STEM Conference 27-29 October, 2022
Pedro Roselló Convention Center, San Juan, Puerto Rico
- 2022 Gulf Coast Undergraduate Research Symposium 8-9 October, 2022
William Marsh Rice University Houston, Texas
- 2022 Junior Technical Meeting-PR Interdisciplinary Scientific Meeting 9 April, 2022
University of Puerto Rico at Humacao Humacao, Puerto Rico
- Joint Mathematics Meetings 2022 6-9 April, 2022
Zoom Conference
- 37th Interuniversity Mathematical Sciences Research Seminar 25-26 February, 2022
Zoom Conference

- 2021 Math REU Conference@Clemson University 19 July, 2021
Zoom Conference. Participating Institutions:
Clemson University, East Tennessee State University, North Carolina A&T, Elon University
- 2021 Junior Technical Meeting-PR Interdisciplinary Scientific Meeting 23-24 April, 2021
Virtual Conference, sponsored by Puerto Rico Louis Stokes Alliance for Minority Participation
- 35th Interuniversity Mathematical Sciences Research Seminar 6-7 March, 2020
University of Puerto Rico at Cayey Cayey, Puerto Rico

WORKSHOPS AND MINI-COURSES	Preliminary Arizona Winter School 2022: Heights and Model Theory Virtual Course <i>Topics: Heights in Diophantine geometry</i> October 2022–November 2022 <i>Organizers: Southwest Center for Arithmetic Geometry, University of Arizona</i> MSRI Modern Math Workshop 2022 San Juan, PR <i>Topics: Mathematical Modeling and Data Science</i> October 2022 <i>Organizers: Hélène Barcelo (MSRI), Christian Ratsch (IPAM), Ulrica Wilson (ICERM)</i> Thematic Program in p-adic L-functions and Eigenvarieties Notre Dame, IN <i>Topics: Modular Forms and Elliptic Curves (Undergraduate Summer School)</i> May 2022–June 2022 <i>Organizers: A. Jorza, C. Raicu, E. O’Dorney (Center for Mathematics, University of Notre Dame)</i> 2022 NSF/STEM: Fellowships Application Workshop Rio Piedras, PR <i>Topics: Grants and Fellowships Workshop</i> May 2022 <i>Organizers: Mike Westrate (Villanova University)</i> Algebraic Coding Theory Workshop Johnson City, TN <i>Topics: Finite Fields and Projective Geometry</i> June 2021 <i>Organizer: Fernando Piñero González (University of Puerto Rico at Ponce)</i>
SKILLS	Programming: Python, SAGEMath, Julia, C++ Software: MATLAB, Git, L ^A T _E X Languages: English (fluent) and Spanish (native)
GRADUATE COURSEWORK	University of Puerto Rico, Mayagüez Campus MATE 6101: Number Theory I MATE 5150: Linear Algebra
STUDENT ASSOCIATIONS	PythagoRUM Mayagüez, PR <i>Co-founder & Vice-President</i> August 2022–December 2022 <ul style="list-style-type: none"> • Served as co-founder and Vice-President for the mathematics and computer science student association. This association has the purpose to promote research in mathematics, as well as related fields of STEM, through professional development workshops and research colloquia. Society of Physics Students, UPRM Chapter Mayagüez, PR <i>Committee Assistant</i> August 2018–May 2023 <ul style="list-style-type: none"> • Served as a Demonstration Committee assistant in 2 physics phenomena presentations. The presentations were for an audience of 20+ elementary school students to motivate them to study science. Served as a Sales Committee assistant in chapter food sales event to improve the chapter’s office. Hermanidad Colegial de Avivamiento August 2018–December 2022 <i>Committee Assistant</i> <ul style="list-style-type: none"> • Served as percussion musician for Hermanidad Colegial de Avivamiento. Went on a mission to the municipality of Vieques, Puerto Rico in the winter of 2019, and helped distribute donated food, clothing and gifts for people in need.

Acting and Music**Mayagüez, PR***Acting: Theater Presentations and Roles*

March 2019–May 2023

- 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)

Music: Alma Latina UPRM

February 2020–March 2020

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