

---

### ***Address***

Auburn University  
221 Parker Hall  
Auburn, AL 36849-5310, USA

---

### ***Personal***

*Citizenship:* U.S.A.

---

### ***Languages***

*Fluent:* English and Spanish (native language).

---

### ***Education***

*May 2017* **Ph.D., Applied Mathematics**, Iowa State University, Ames, IA, USA.

Advisor: Dr. Leslie Hogben.

Dissertation title: *Principal rank characteristic sequences*.

*May 2011* **B.S., Pure Mathematics**, University of Puerto Rico–Mayagüez, Mayagüez, PR, USA.

---

### ***Honors***

*Fall 2016* **Aggie Ho Research Award**.

This award recognizes research excellence, and it was awarded to one of the 80 graduate students in the Dept. of Mathematics at Iowa State University.

---

### ***Research Interests***

Linear algebra, spectral graph theory and combinatorics.

---

### ***Appointments***

*Aug. 2017 – present* **Visiting Assistant Professor (postdoc)**, Auburn University, Dept. of Mathematics and Statistics, Auburn, AL, USA.

*Jan. 2017 – July 2017* **Assistant Conference Director for the 21<sup>st</sup> Meeting of the International Linear Algebra Society, ILAS 2017: Connections** (367 participants and 277 talks), Iowa State University, Dept. of Mathematics, Ames, IA, USA.

*Aug. 2011 – Dec. 2016* **Graduate Teaching Assistant**, Iowa State University, Dept. of Mathematics, Ames, IA, USA.

---

## *Select Collaborative Research Experiences*

July 17–29, 2016 **Rocky Mountain-Great Plains Graduate Research Workshop in Combinatorics (GRWC)**, hosted by University of Wyoming.

July 13–17, 2015 **Focused Research Group**, hosted by Iowa State University.  
Besides Xavier, the other participants were 7 faculty members and 1 other graduate student.

Summer 2010 **REU: Mathematics and Statistics Research Experiences for Undergraduates (ISU Math-Stat REU)**, hosted by Iowa State University.  
Mentors: Dr. Leslie Hogben and Dr. Minerva Catral.

Summer 2009 **REU: Mathematical and Theoretical Biology Institute (MTBI)**, hosted by Arizona State University.  
Mentor: Dr. Christopher Kribs-Zaleta.

---

## *Peer-Reviewed Journal Publications*

### *Submitted for publication*

- [10] S. M. Fallat, **X. Martínez-Rivera**, On the almost-principal minors of a symmetric matrix, submitted. [[arxiv.org/abs/1807.07448](https://arxiv.org/abs/1807.07448)]

### *Published/in press/to appear*

- [9] A. Abiad, B. Brimkov, **X. Martínez-Rivera**, S. O, J. Zhang, Spectral bounds for the connectivity of regular graphs with given order, *Electronic Journal of Linear Algebra* **34** (2018), 428–443.
- [8] S. M. Fallat, **X. Martínez-Rivera**, The quasi principal rank characteristic sequence, *Linear Algebra and its Applications* **548** (2018), 42–56. [[doi.org/10.1016/j.laa.2018.02.024](https://doi.org/10.1016/j.laa.2018.02.024)]
- [7] **X. Martínez-Rivera**, The signed enhanced principal rank characteristic sequence, *Linear and Multilinear Algebra*, **66**(7) (2018), 1484–1503. [[dx.doi.org/10.1080/03081087.2017.1363149](https://dx.doi.org/10.1080/03081087.2017.1363149)]
- [6] A. Abiad, B. Brimkov, A. Erey, L. Leshock, **X. Martínez-Rivera**, S. O, S.-Y. Song, J. Williford, On the Wiener index, distance cospectrality and transmission regular graphs, *Discrete Applied Mathematics* **230** (2017), 1–10. [[doi.org/10.1016/j.dam.2017.07.010](https://doi.org/10.1016/j.dam.2017.07.010)]
- [5] **X. Martínez-Rivera**, The enhanced principal rank characteristic sequence over a field of characteristic 2, *Electronic Journal of Linear Algebra* **32** (2017), 273–290. [[doi.org/10.13001/1081-3810.3389](https://doi.org/10.13001/1081-3810.3389)]
- [4] S. Butler, M. Catral, H. T. Hall, L. Hogben, **X. Martínez-Rivera**, B. Shader, P. van den Driessche, The enhanced principal rank characteristic sequence for Hermitian matrices, *Electronic Journal of Linear Algebra* **32** (2017), 58–75. [[dx.doi.org/10.13001/1081-3810.3249](https://dx.doi.org/10.13001/1081-3810.3249)]
- [3] **X. Martínez-Rivera**, Classification of families of pr- and epr-sequences, *Linear and Multilinear Algebra*, **65**(8) (2017), 1581–1599. [[dx.doi.org/10.1080/03081087.2016.1248345](https://dx.doi.org/10.1080/03081087.2016.1248345)]

- [2] M. Archer, M. Catral, C. Erickson, R. Haber, L. Hogben, **X. Martínez-Rivera**, A. Ochoa, Potentially eventually exponentially positive sign patterns, *Involve* **6**(3) (2013), 261–271. [[dx.doi.org/10.2140/involve.2013.6.261](https://doi.org/10.2140/involve.2013.6.261)]
- [1] M. Archer, M. Catral, C. Erickson, R. Haber, L. Hogben, **X. Martínez-Rivera**, A. Ochoa, Constructions of potentially eventually positive sign patterns with reducible positive part, *Involve* **4**(4) (2011), 405–410. [[dx.doi.org/10.2140/involve.2011.4.405](https://doi.org/10.2140/involve.2011.4.405)]

## Technical Reports

- M. Muñoz-Figueroa, **X. Martínez-Rivera**, T. Seaquist, B. Crawford, A. Mubayi, K. Salau, C. Kribs-Zaleta. Two strain competition: Trypanosoma cruzi. Written during the Mathematical and Theoretical Biology Institute (MTBI) REU (2009). (See the *Collaborative Research Experiences* section above.) [[mtbi.asu.edu/2009-7](http://mtbi.asu.edu/2009-7)]

## Invited Talks

- Jan. 2019* **The almost-principal minors and ap-rank of symmetric matrices**, *2019 Joint Mathematics Meetings (AMS Special Session on If You Build It They Will Come: Presentations by Scholars in the National Alliance for Doctoral Studies in the Mathematical Sciences)*, Baltimore, MD, USA.
- Dec. 2017* **The epr-sequence over a field of characteristic 2**, *Matrix Theory Seminar*, Georgia State University, Atlanta, GA, USA.
- July 2017* **The signed epr-sequence**, *21<sup>st</sup> Conference of the International Linear Algebra Society (ILAS) (Mini-symposium on Combinatorial Matrix Theory)*, Iowa State University, Ames, IA, USA.
- July 2017* **The sepr-sequence of a Hermitian matrix**, *Special Western Canada Linear Algebra Meeting (WCLAM)*, Banff International Research Station (BIRS), Banff, Alberta, Canada.
- June 2017* **Principal rank characteristic sequences**, *Linear Algebra Seminar*, Auburn University, Auburn, AL, USA.
- Oct. 2016* **The epr-sequence over a field of characteristic 2**, *AMS Fall Central Sectional Meeting (Special Session on Combinatorial Matrix Theory)*, University of St. Thomas–Minnesota, Minneapolis, MN, USA.
- April 2016* **Classification of families of pr- and epr-sequences**, *AMS Spring Central Sectional Meeting (Special Session on Matrix and Operator Theory)*, North Dakota State University, Fargo, ND, USA.
- March 2016* **Classification of families of pr- and epr-sequences**, *47<sup>th</sup> Southeastern International Conference on Combinatorics, Graph Theory and Computing (SEICCGTC) (Special Session on Combinatorial Matrix Theory, in honor of LeRoy Beasley)*, Florida Atlantic University, Boca Raton, FL, USA.

## Contributed Talks

- May 2018* **The qpr-sequence**, *Western Canada Linear Algebra Meeting (WCLAM)*, Washington State University, Pullman, WA, USA.

- March 2018* **The quasi principal rank characteristic sequence**, XXXIII Seminario Interuniversitario de Investigación en Ciencias Matemáticas (SIDIM), University of Puerto Rico–Río Piedras, San Juan, PR, USA.
- March 2017* **The signed enhanced principal rank characteristic sequence**, XXXII Seminario Interuniversitario de Investigación en Ciencias Matemáticas (SIDIM), University of Puerto Rico–Ponce, Ponce, PR, USA.
- Jan. 2017* **The epr-sequence over a field of characteristic 2**, 2017 Joint Mathematics Meetings, Atlanta, GA, USA.
- July 2016* **Classification of families of pr- and epr-sequences**, 20<sup>th</sup> Conference of the International Linear Algebra Society (ILAS), Katholieke Universiteit (KU) Leuven, Leuven, Belgium.
- May 2016* **Classification of families of pr- and epr-sequences**, Western Canada Linear Algebra Meeting (WCLAM), University of Manitoba, Winnipeg, Manitoba, Canada.
- Oct. 2015* **The principal rank characteristic sequence and the enhanced principal rank characteristic sequence**, SIAM Conference on Applied Linear Algebra, Atlanta, GA, USA.
- July 2012* **Classification of potentially eventually exponentially positive sign patterns of small order**, 2012 SIAM Annual Meeting, Minneapolis, MN, USA.

---

### *Departmental Talks*

- Jan. 2019* **The almost-principal minors and ap-rank of symmetric matrices**, Linear Algebra/Algebra Seminar, Auburn University, Auburn, AL, USA.
- Nov. 2018* **The qpr-sequence**, Linear Algebra/Algebra Seminar, Auburn University, Auburn, AL, USA.
- Sept. 2017* **A new principal rank characteristic sequence**, Linear Algebra/Algebra Seminar, Auburn University, Auburn, AL, USA.
- Oct. 2015* **The principal rank characteristic sequence and the enhanced principal rank characteristic sequence**, SIAM ISU Student Chapter, Iowa State University, Ames, IA, USA.

---

### *Posters Presented (as an Undergraduate)*

- Oct. 2010* **Classification of potentially eventually exponentially positive sign patterns of small order**, (joint with Rana Haber) 2010 SACNAS National Conference, Anaheim, CA, USA.
- Feb. 2010* **Two strain competition: Trypanosoma cruzi**, NEA Science Day, University of Puerto Rico–Mayagüez, Mayagüez, PR, USA.
- Oct. 2009* **Two strain competition: Trypanosoma cruzi**, 2009 SACNAS National Conference, Dallas, TX, USA.

Sept. 2009 **Two strain competition: Trypanosoma cruzi**, Ana G. Méndez University System (AGMUS) XX Undergraduate Research Symposium, San Juan, PR, USA.

---

### ***Other Conferences Attended***

Sept. 2012 **Midwestern Graph Theory (MIGHTY) LIII Conference**, Iowa State University, Ames, IA, USA.

July 2010 **2010 NSF-CBMS Regional Conference: The Mutually Beneficial Relationship of Matrices and Graphs**, Iowa State University, Ames, IA, USA.

July 2009 **2009 SIAM Annual Meeting**, Denver, CO, USA.

---

### ***Special Session Organizer***

March 15-17, 2019 **Special Session on Combinatorial Matrix Theory** (with Zhongshan Li), *AMS Spring Southeastern Sectional Meeting*, Auburn University, Auburn, AL, USA.

---

### ***Travel Grants***

Jan. 2017 **AMS Graduate Student Travel Grant**.  
Amount: \$500(USD). To support travel expenses to attend the 2017 Joint Mathematics Meetings.

---

### ***Reviewer Work***

2017–present **Mathematical Reviews**

---

### ***Referee Work***

2016–present **Filomat**

---

### ***Miscellaneous Service***

March 26, 2018 **Judge of Poster Session**, 2018 *This is Research: Student Symposium*, Auburn University, Auburn, AL, USA.

July 28, 2017 **Invited Session Chair** (of one session), *Special Western Canada Linear Algebra Meeting (WCLAM)*, Banff International Research Station (BIRS), Banff, Alberta, Canada.

---

### ***Teaching Experience at Auburn University***

Spring 2019 **Math 1610**, *Calculus I*, Instructor of Record (with full responsibilities).

Fall 2018 **Math 2660 (two sections)**, *Topics in Linear Algebra*, Instructor of Record (with full responsibilities).

Spring 2018 **Math 2660**, *Topics in Linear Algebra*, Instructor of Record (with full responsibilities).

Fall 2017 **Math 1610**, *Calculus I*, Instructor of Record (with full responsibilities).

---

### ***Teaching Experience at Iowa State University***

- Fall 2016* **Math 265**, Calculus III, Recitation Leader.  
*Spring 2016* **Math 265**, Calculus III, Recitation Leader.  
*Fall 2015* **Math 265**, Calculus III, Recitation Leader.  
*Spring 2015* **Math 165**, Calculus I, Recitation Leader.  
*Fall 2014* **Math 165**, Calculus I, Recitation Leader.  
*Fall 2013* **Math 142**, Trigonometry and Analytic Geometry, Recitation Leader.  
*Fall 2012* **Math 151**, Calculus for Business and Social Sciences, Recitation Leader.  
*Spring 2012* **Math 150**, Discrete Mathematics for Business and Social Sciences, Lab Tutor.

---

### ***Grading Experience (at Iowa State University)***

- Fall 2011* **Math 181**, Calculus and Mathematical Modeling for the Life Sciences I.  
*Fall 2011* **Math 201**, Introduction to Proofs.

---

### ***Pedagogical Training***

- June 30 – July 1, 2014* **Pathways to Precalculus (2-day) Workshop**, hosted by Iowa State.  
Conducted by Dr. Marilyn Carlson (Arizona State University).

---

### ***Memberships***

- 2011–present* **International Linear Algebra Society (ILAS)**  
*2011–present* **American Mathematical Society (AMS)**  
*2012–present* **Society for Industrial and Applied Mathematics (SIAM)**  
*2016–present* **Mathematical Association of America (MAA)**  
*2016–2017* **Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS)**  
*2016–2017* **Sigma Xi: The Scientific Research Society** (*Associate member*)