Roberto Barrera

Curriculum Vitae

CONTACT INFORMATION

Texas State University
Department of Mathematics
601 University Drive
San Marcos, TX 78666, USA

E-mail: rbarrera@txstate.edu

EDUCATION

Texas A&M University, College Station, Texas USA
Ph.D., Mathematics — August 2017
Thesis: *Local Cohomology: Combinatorics and D-modules*
Advisor: Laura Matusevich

Texas State University, San Marcos, Texas USA
B.S., Mathematics — May 2009
Thesis: *On the Power Domination Problem in Graphs*
Advisor: Daniela Ferrero

EMPLOYMENT

Texas State University, San Marcos, Texas USA

Associate Professor of Instruction	September 2024 – Current
Senior Lecturer	September 2021 – August 2024
Lecturer	September 2017 – August 2021

AWARDS

Texas State Department of Mathematics Teaching Excellence Award — December 2020

Alpha Chi Favorite Professor Award, The Alfred H. Nolle Chapter of the Alpha Chi National College Honor Society — April 2019

Dr. Joseph Newton Graduate Student Service Award — May 2017
Awarded to Texas A&M Science graduate students with distinguished records of service to their university, college, departments, professions or community

Houston A&M Mother's Club Outstanding TA Award — May 2015

PUBLICATIONS AND PREPRINTS

Roberto Barrera. Quasidegrees of A-graded modules. *Journal of Software for Algebra and Geometry*, 9 No. 1 (2019) 29–34.

Roberto Barrera and Daniela Ferrero. Power domination in cylinders, tori, and generalized Petersen graphs, *Networks*, 58 No. 1 (2011) 43–49.

Roberto Barrera, Jeffrey Madsen, and Ashley K. Wheeler. Finiteness of Associated Primes of Local Cohomology Modules Over Stanley-Reisner Rings, 2016. arXiv:1609.05366

Roberto Barrera, Kathryn Nyman, Amanda Ruiz, Francis Edward Su, and Yan X. Zhang. Discrete Envy-free Division of Necklaces and Maps, 2015. arXiv:1510.02132

SOFTWARE

Roberto Barrera. Quasidegrees: Software for computing quasidegrees of modules. Available at `https://msp.org/jsag/2019/9-1/jsag-v9-n1-x04-Quasidegrees.m2`

TALKS

A finiteness result for local cohomology modules of Stanley-Reisner rings, Discrete Math Seminar, Texas State University November 2017

A finiteness result for local cohomology modules of Stanley-Reisner rings, Graduate Students Seminar, Texas A&M University February 2017

A finiteness result for local cohomology modules of Stanley-Reisner rings, Geometry Seminar, Texas A&M University December 2016

The classical cake cutting problem and discrete analogues, CombinaTexas 2016, Texas A&M University May 2016

A finiteness result for local cohomology modules of Gorenstein Stanley-Reisner rings, AMS Spring Sectional Meeting #1120: Special Session on Combinatorial Ideals and Applications, North Dakota State University April 2016

The classical cake cutting problem and discrete analogues, Texas State University-San Marcos February 2016

The classical cake cutting problem and discrete analogues, Graduate Students Seminar, Texas A&M University February 2016

Quasidegrees of $\mathbb{Z}^d$-graded modules, AMS Spring Sectional Meeting #1100: Homological methods in algebra, Texas Tech University April 2014

Power domination in cylinders and tori, CombinaTexas 2009, University of Houston April 2009

POSTERS

A finiteness result for local cohomology of Stanley-Reisner rings, Southwest Local Algebra Meeting (SLAM), Texas State University-San Marcos February 2016

Quasidegrees of $\mathbb{Z}^d$-graded modules, Algecom 10, University of Illinois-Urbana-Champaign May 2014

Quasidegrees of $\mathbb{Z}^d$-graded modules, Southwest Local Algebra Meeting (SLAM) 2014, Texas A&M University March 2014

WORKSHOPS ATTENDED

Summer Teaching Workshop for CoSE Faculty, Texas State University May 2021

Summer Teaching Workshop for CoSE Faculty, Texas State University May 2020

Chip firing and tropical curves, MSRI July 2016 – August 2016

D-modules in commutative algebra, CIMAT – Guanajuato August 2015

Mathematics Research Communities – Commutative Algebra, Snowbird, UT June 2015

Macaulay2 Workshop, Boise State University May 2015

Mathematics Research Communities – Algebraic and Geometric Methods in Applied Discrete Mathematics, Snowbird, UT June 2014

Macaulay2 Workshop, MSRI January 2014

School on Algebraic Geometry, Centro de Ciencias Matemáticas de la UNAM – Morelia July 2013

Institute of Mathematics and Applications Summer Graduate Program: Algebraic Geometry for Applications, Georgia Institute of Technology June 2012 – July 2012

TEACHING EXPERIENCE

Texas State University, San Marcos, Texas USA

Math 3398 – Discrete Mathematics II

Math 2358 – Discrete Mathematics I

Math 2472 – Calculus II

Math 4771 – Calculus I

Math 2417 – Precalculus

Math 1329 – Mathematics for Business and Economics II

Math 1319 – Mathematics for Business and Economics I

CURRICULUM DESIGN

Texas State University, San Marcos, Texas USA

Math 2358 – Discrete Mathematics I (Self-paced)

MENTORING

Graduate Student Mentor, Texas State University Fall 2024 – Current

Lecturer Mentor, Texas State University Fall 2021 – Current

Esther Conrad – Master's Committee Graduated May 2018
Thesis: *Zero forcing in graphs and digraphs*

REFEREE

American Mathematical Monthly

Journal of Algebra Combinatorics Discrete Structures and Applications

SERVICE AND OUTREACH ACTIVITIES

Academic Professional Faculty Hiring Committee, Texas State University Fall 2025 – current

Organizer, Discrete Math Teaching Forum, Texas State University Fall 2019 – Spring 2024

Judge, FIRST Robotics Competition, Dripping Springs High School March 2022

Organizer, Graduate Students Seminar, Texas A&M University August 2014 – August 2016

Representative, Graduate Students Organization, Texas A&M University August 2014 – August 2016

Panelist, Choosing an advisor, First Year Graduate Student Seminar, Texas A&M University February 2016, February 2014

Grader, High School Mathematics Contest, Texas A&M University 2013 – 2016

Speaker, Department orientation for incoming graduate students, Texas A&M University August 2015, August 2014

Panelist, Applying to graduate school, REU, Texas A&M University Summer 2015

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