Ryan Alvarado, PhD

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Personal Information

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Academic Positions

Jul 2025 - *present*	Associate Professor of Mathematics in the Department of Mathematics at Amherst College, Amherst, MA
Jul 2018 - Jul 2025	Assistant Professor of Mathematics in the Department of Mathematics and Statistics at Amherst College, Amherst, MA
Jul 2015 - Jul 2018	Postdoctoral Research Fellow in the Department of Mathematics at The University of Pittsburgh, Pittsburgh, PA Duties for this appointment were two-fold. On the one hand, I worked closely with the faculty in the department to develop and expand my research program. On the other, I coordinated and taught several courses in the department while managing graduate teaching assistants.
Jul 2008 - Jul 2015	Graduate Teaching Fellow in the Department of Mathematics at The University of Missouri, Columbia, MO I was the lecturer for several courses in the department. In addition, I assisted tenured faculty by leading recitations, grading, and running review/help sessions.

Education

May 2015	Doctor of Philosophy in Mathematics, **The University of Missouri**, Columbia, MO Thesis: "Topics in Geometric Analysis and Harmonic Analysis in Spaces of Homogeneous Type" | Advisor: Professor Marius Mitrea
May 2011	Master of Arts in Mathematics, **The University of Missouri**, Columbia, MO Thesis: "Topics in Harmonic Analysis and Partial Differential Equations: Extension Theorems and Geometric Maximum Principles" | Advisor: Professor Marius Mitrea
May 2008	Bachelor of Arts in Mathematics, **William Jewell College**, Liberty, MO *summa cum laude*, Phi Epsilon Honor Society (top 10% of graduating class) | Gpa 3.921
May 2008	Bachelor of Arts in Physics, **William Jewell College**, Liberty, MO *summa cum laude*, Phi Epsilon Honor Society (top 10% of graduating class) | Gpa 3.921

Research Interests

I am interested in working on problems in nonsmooth settings and determining how the geometric make-up of the underlying environment can influence the type of analysis which can be performed. These problems are at the junction of Geometric Analysis, Harmonic Analysis, and Partial Differential Equations. Some topics include analysis in metric measure spaces, smoothness spaces (Hardy, Sobolev, Besov, Triebel-Lizorkin, Mixed-Norm,...), second and higher order elliptic differential systems in various domains, boundary value problems, boundary integral methods, and the geometry of rough domains.

Publications

Book

[1] *A Sharp Theory of Hardy Spaces on Ahlfors-Regular Quasi-Metric Spaces*, with Marius Mitrea, Springer Lecture Notes in Mathematics, Vol.2142, (2015), viii+486 pp.

Papers

[2] *Borel regularity is equivalent to Lusin's theorem and the existence of Borel representatives*, with Przemysław Górka and Artur Słabuszewski, 14 pp. (Submitted for publication)

[3] *Compact embeddings of Sobolev, Besov, and Triebel-Lizorkin spaces,* with Przemysław Górka and Artur Słabuszewski, J. Differential Equations 446 (2025), 113598, 64 pp.

[4] *Optimal embeddings for Triebel–Lizorkin and Besov spaces on quasi-metric measure spaces*, with Dachun Yang and Wen Yuan, Math. Z. 307, 50 (2024).

[5] *A simple proof of reflexivity and separability of* $\mathrm{N}^{1,p}$ *Sobolev spaces*, with Piotr Hajłasz and Lukás Maly, Ann. Fenn. Math. 48 (2023), no. 1, 255-275.

[6] *Pointwise characterization of Besov and Triebel–Lizorkin spaces on spaces of homogeneous type*, with Fan Wang, Dachun Yang, and Wen Yuan, Studia Math. 268 (2023), no. 2, 121–166.

[7] *A measure characterization of embedding and extension domains for Sobolev, Triebel–Lizorkin, and Besov spaces on spaces of homogeneous type*, with Dachun Yang and Wen Yuan, J. Funct. Anal. 283 (2022), no. 12, Paper No. 109687, 71 pp.

[8] *The game of cycles,* with Maia Averett, Benjamin Gaines, Christopher Jackson, Mary Leah Karker, Małgorzata Aneta Marciniak, Francis Edward Su, and Shanise Walker, Amer. Math. Monthly 128 (2021), no. 10, 868-887

[9] *Sobolev embedding for* $\mathrm{M}^{1,p}$ *spaces is equivalent to a lower bound of the measure*, with Przemysław Górka and Piotr Hajłasz, J. Funct. Anal. 279 (2020), no. 7, 39 pp.

[10] *A note on metric-measure spaces supporting Poincaré inequalities*, with Piotr Hajłasz, Atti Accad. Naz. Lincei Rend. Lincei Mat. Appl. 31 (2020), no. 1, pp. 15–23.

[11] *Whitney-type extensions with control of the modulus of continuity in geometrically doubling quasi-metric spaces*, with Irina Mitrea and Marius Mitrea, Commun. Pure Appl. Anal., 12 (2013), No. 1, pp. 59–88.

[12] *Sharp geometric maximum principles for semi-elliptic operators with singular drift*, with Daniel Brigham, Vladimir Maz'ya, Marius Mitrea, and Elia Ziadé, Math. Res. Lett., Vol.18 (2011), No. 04, pp. 613–620.

[13] *On the regularity of domains satisfying a uniform hour-glass condition and a sharp version of the Hopf-Oleinik Boundary Point Principle*, with Daniel Brigham, Vladimir Maz'ya, Marius Mitrea, and Elia Ziadé, Journal of Mathematical Sciences, Vol. 176 (2011), No. 3, pp. 281–360.

Math Talks

Research Talks

May 2025	Conference in honor of Marius Mitrea's 60th birthday. Baylor University, Waco, TX. (Plenary talk)
Feb 2025	Analysis Seminar. University of Tennessee–Knoxville, Knoxville, TN.
Jan 2025	Joint Mathematics Meetings. Seattle, WA. *Special Session on Non-smooth Analysis and Geometry.*

Jan 2025	Joint Mathematics Meetings. Seattle, WA. *Special Session on Analysis and Differential Equations at Undergraduate Institutions*
Oct 2024	AMS Fall Eastern Sectional Meeting. University at Albany, Albany, NY. *Special Session on Recent Advances in Harmonic Analysis.*
Apr 2024	AMS Spring Eastern Sectional Meeting. Howard University, Washington, DC. *Special Session on Interactions Between Analysis, Geometric Measure Theory, and Probability in Non-Smooth Spaces.*
Jan 2024	Joint Mathematics Meetings. San Francisco, CA. *Special Session on Analysis and Differential Equations at Undergraduate Institutions.*
Nov 2023	Analysis and Applied Mathematics Seminar. Kennesaw State University, Kennesaw, GA.
Jun 2023	13th biannual Conference on Dynamical Systems, Differential Equations and Applications. Wilmington, NC. *Special Session on Harmonic Analysis and Partial Differential Equations.*
May 2023	Lathisms Lecture Series: Café con Leche
Apr 2023	AMS Spring Central Sectional Meeting. University of Cincinnati, Cincinnati, OH. *Special Session on Inequalities in Harmonic Analysis.*
Feb 2023	Progress in Analysis: Challenges, Zeitgeist, and Key Inspirations. University of Warsaw, Warsaw, Poland.
Jan 2023	Joint Mathematics Meetings. Boston, MA. *Special Session on Advances and Applications in Integral and Differential Equations.*
Oct 2022	AMS Fall Eastern Sectional Meeting. University of Massachusetts-Amherst, Amherst, MA. *Special Session on Latinx in Number Theory, Combinatorics and Geometry/Topology.*
Aug 2022	Analysis Seminar. University of New Mexico, Albuquerque, NM.
Jul 2022	Analysis Seminar. (2 lectures) Beijing Normal University, Beijing, China.
Jun 2022	The 51st John and Lida Barrett Memorial Lectures: Exotic continua in modern mathematics. University of Tennessee, Knoxville, Knoxville, TN.
Feb 2022	Analysis Seminar. University of Alabama, Tuscaloosa, AL.
Jan 2022	Joint Mathematics Meetings. Seattle, WA. *Special Session on Analysis and Differential Equations at Undergraduate Institutions.*
Nov 2021	PDE and Analysis Seminar. University of Pittsburgh, Pittsburgh, PA.
Nov 2021	The 17th Prairie Analysis Seminar. Kansas State University, Manhattan, KS.
Oct 2021	AMS Fall Central Sectional Meeting. *Special Session on Analysis and Differential Equations at Undergraduate Institutions.*
Jun 2021	PDE Seminar. Warsaw University of Technology, Warsaw, Poland.

Jun 2021	CMS 75th+1 Anniversary Summer Meeting, Ottawa, Canada. *Special Session on Harmonic Analysis and Partial Differential Equations.*
Sep 2020	Online Geometric Analysis Seminar. http://blatt.sbg.ac.at/onlineseminar.php
Jun 2020	13th biannual Conference on Dynamical Systems, Differential Equations and Applications. Atlanta, GA. *Special Session on Harmonic Analysis and Partial Differential Equations.* Cancelled due to COVID
Jan 2020	Joint Mathematics Meetings. Denver, CO. *Special Session on Analysis and Differential Equations at Undergraduate Institutions.*
Nov 2019	Latest in Geometric Analysis: In Celebration of Pekka Koskela's 59th Birthday. Bedlewo, Poland. (poster presentation)
Aug 2019	Analysis Seminar. Beijing Normal University, Beijing, China.
May 2019	PDE and Analysis Seminar. University of Pittsburgh, Pittsburgh, PA.
Apr 2019	Analysis and PDE Seminar. Worcester Polytechnic Institute, Worcester, MA.
Mar 2019	Ninth Ohio River Analysis Meeting. University of Cincinnati, Cincinnati, OH.
Oct 2018	2018 Northeastern Analysis Meeting. State University of New York at New Paltz, New Paltz, NY.
Jun 2018	Canadian Mathematical Society Summer Meeting. University of New Brunswick, Fredericton, New Brunswick, Canada, *Special Session on Advances in Harmonic Analysis and PDE's.*
Apr 2017	Kent State Informal Analysis Seminar with the special theme on differentiation in finite and infinite dimensional spaces. Kent State University, Kent, OH. (poster presentation)
Sep 2016	Fixed Points and Banach Spaces. University of Pittsburgh, Pittsburgh, PA.
Apr 2015	Analysis and PDE Seminar. University of Cincinnati, Cincinnati, OH.
Apr 2015	Latinos in the Mathematical Sciences Conference IPAM, University of California - Los Angeles, Los Angeles, CA.
Feb 2015	Fifth Ohio River Analysis Meeting. University of Cincinnati, Cincinnati, OH.
Jan 2015	Analysis Seminar. Oklahoma State University - Stillwater, Stillwater, OK.
Jan 2015	Workshop on Harmonic Analysis, PDE's and Geometric Measure Theory. Instituto de Ciencias Matemáticas, Madrid, Spain.
Jan 2015	Analysis and Apps Seminar. Instituto de Ciencias Matemáticas, Madrid, Spain.
Oct 2014	AMS Fall Western Sectional Meeting. San Francisco State University, San Francisco, CA *Special Session on Recent Progress in Harmonic Analysis and Several Complex Variables.*
Apr 2014	Progress in Harmonic Analysis and Geometric Measure Theory. Temple University, Philadelphia, PA.

Mar 2014 | AMS Spring Southeastern Sectional Meeting. University of Tennessee, Knoxville, Knoxville, TN. *Special Session on Complex Analysis, Probability, and Metric Geometry.*

Oct 2013 | AMS Fall Southeastern Sectional Meeting. University of Louisville, Louisville, KY. *Special Session on Harmonic Analysis and Partial Differential Equations.*

Sep 2012 | Perspectives in Harmonic Analysis, Geometric Measure Theory, and Partial Differential Equations, and their applications to Several Complex Variables. Temple University, Philadelphia, PA (poster presentation).

Talks for Undergraduates

Apr 2024 | Augustana University Math Colloquium. Augustana Univ., Sioux Falls, SD.

Feb 2021 | Reed College Math Seminar. Reed College, Portland, OR.

Oct 2020 | Mathematics Continued Conference: A Research Conference for Undergraduates. University of Connecticut, Storrs, CT.

Oct 2018 | Connecticut College Math Seminar. Connecticut College, New London, CT.

Extended Math Research Visits

Jun 2023 | Warsaw University of Technology, Warsaw, Poland (*1.5 weeks*)

Jul 2022 | Beijing Normal University, Beijing, China (*4 weeks, remote*)

Apr 2022 | University of Pittsburgh, Pittsburgh, PA (*4 weeks*)

Feb-Mar 2022 | University of Alabama, Tuscaloosa, AL (*6 weeks*)

Nov 2021 | University of Pittsburgh, Pittsburgh, PA (*4 weeks*)

Aug 2019 | Beijing Normal University, Beijing, China (*1.5 weeks*)

Jul 2019 | Warsaw University of Technology, Warsaw, Poland (*1 week*)

Research in Math Education

Projects

Jan 2020 - *present* | **Identity and Sense of Belonging in an Introduction to Analysis Course Supported by Student Partners.**
In work joint with Abigail Higgins (Sacramento State University) and Sayonita Ghosh Hajra (Sacramento State University), we are examining disciplinary identity and sense of belonging in an upper-division mathematics course that is supported by Student Partners, who take daily in-class observations and meet with the instructor each week for 60-75 minutes to discuss their notes and reflections on the course.

Aug 2017 - Aug 2018 | **Aligning Teaching Methods and Students' Learning Needs: Active Learning vs Traditional Classrooms.**
This is an interdisciplinary project lead by Dana Miller-Cotto (Learning and Research Center, Univ. of Pittsburgh), Armin Schikorra (Math. Dept., Univ. of Pittsburgh), and I aimed at identifying key characteristics of a student which would make them more likely to succeed in an active learning vs traditional classroom environment.

Publications in Math Education

Comments on scholarly work: This conference paper was peer reviewed and the work was shared equally among all authors.

[1] *Promoting Student Agency and Engagement Through Student Partnerships: A Case of an Introduction to Analysis Course,* with Abigail Higgins and Sayonita Ghosh Hajra, 2021 Research in Undergraduate Mathematics Education Reports (pp. 117-123)

Talks in Math Education

Aug 2021	MAA MathFest. *Contributed Paper Session on Research on Undergraduate Mathematics Education*
Oct 2020	4th Northeastern Conference on Research in Undergraduate Mathematics Education. Temple University, Philadelphia, PA.

Teaching Experience

At Amherst College, Amherst, MA

List of Courses by Year (on sabbatical academic year 2021-22)

Fall 2024	Math 271: Linear Algebra (28 students) Math 355: Introduction to Analysis (26 students)
Spring 2024	Math 355: Introduction to Analysis (30 students) Math 450: Measure Theory and Integration (7 students)
Fall 2023	Math 121: Intermediate Calculus (25 students) Math 271: Linear Algebra (26 students)
Spring 2023	Math 271: Linear Algebra (26 students) Math 355: Introduction to Analysis (23 students)
Fall 2022	Math 271: Linear Algebra (23 students) Math 355: Introduction to Analysis (25 students)
Spring 2021	Math 355: Introduction to Analysis (2 sections, 49 students, Async.)
Fall 2020	Math 105: Calculus with Algebra (13 students, HyFlex)
Spring 2020	Math 355: Introduction to Analysis (26 students) Math 372: Real Analysis in Higher Dimensions (10 students)
Fall 2019	Math 355: Introduction to Analysis (2 sections, 49 students)
Spring 2019	Math 221: Transition to Theoretical Mathematics (11 students) Math 355: Introduction to Analysis (25 students)
Fall 2018	Math 111: Introduction to the Calculus (31 students) Math 221: Transition to Theoretical Mathematics (19 students)

Undergraduate Honors Thesis Students

2023 - 2024	Phillip Zhou (Class of 2024) Title: The Ins and Outs of Optimal Transport (75 pages). Magna cum laude.

2020 - 2021	Jonah Botvinick-Greenhouse (Class of 2021) Title: An Introduction to the Theory of the Ergodic Partition (85 pages). Summa cum laude, co-winner of Breusch prize[1]
2019 - 2020	Max Fox-Jurkowitz (Class of 2020) Title: Set Representation Using Convex Analysis and Choquet's Theorems (143 pages). Summa Cum Laude, co-winner of Breusch prize.

List of Courses with Descriptions

Calculus with Algebra (Math 105)	This course is designed for students whose background and algebraic skills are inadequate for the fast pace of Calculus I (MATH 111). In addition to covering the usual material of beginning calculus, these courses will have an extensive review of algebra and trigonometry. There will be a special emphasis on solving word problems with one weekly meeting period used as a two-hour group-work day. *Fall 2020*
Intro to the Calculus (Math 111)	Basic concepts of limits, derivatives, anti-derivatives; applications, including max/min problems and related rates; the definite integral, simple applications; trigonometric functions; logarithms and exponential functions. *Fall 2018*
Intermediate Calculus (Math 121)	A continuation of Math 111. Inverse trigonometric and hyperbolic functions; methods of integration, both exact and approximate; applications of integration to volume and arc length; improper integrals; l'Hôpital's rule; infinite series, power series and the Taylor development; and polar coordinates. *Fall 2023*
Transition to Theoretical Math (Math 221)	This course is an introduction to proofs and abstract mathematical thinking, serving as a bridge from introductory classes such as calculus to more advanced proof-based classes. The principal goal of this class is to help students develop skills for both reading and writing mathematical proofs. Topics covered may include fundamentals of logic, quantifiers, proof techniques, mathematical induction, elementary set theory, equivalence relations, functions, and the notions of countability and uncountability. Some topics in analysis will also be surveyed, such as open and closed sets in the real line, sequences of real numbers, and limits of functions. *Spring 2019, Fall 2018*
Linear Algebra (Math 271)	This course concerns the study of vector spaces over the real and complex numbers, introducing the concepts of subspace, linear independence, basis, and dimension; systems of linear equations and their solution by Gaussian elimination; matrix operations; linear transformations and their representations by matrices; eigenvalues and eigenvectors; and inner product spaces. MATH 271 features both proofs and applications, with special attention paid to the theoretical development of the subject. *Fall 2023, Spring 2023, Fall 2022*

[1] Each year, the Robert H. Breusch Prizes are awarded to the seniors who, in the opinion of the faculty, have presented the best honors theses in mathematics and statistics.

Introduction to Analysis (Math 355)

This course provides an introduction to analysis via the study of functions of one real variable. Several aspects of this theory will be explored, such as principles behind the real number system; topology of n-space including the Bolzano-Weierstrass and Heine-Borel theorems; sequences, properties of continuous functions on sets; infinite series, and uniform convergence.

Spring 2024, Spring 2023, Fall 2022, Spring 2021, Spring 2020, Fall 2019, Spring 2019

Analysis in Higher Dimensions (Math 372)

This course builds upon the material in MATH 355 (Introduction to Analysis) in order to rigorously develop basic tools for studying functions of more than one real variable. While the setting in MATH 355 is the real number line, the context for this course will be the n-dimensional Euclidean space. Many facets of analysis on this n-dimensional space will be explored including its topological properties as well as differentiation and Riemann integration in n-variables. The course will cover fundamental results such as the celebrated implicit and inverse function theorems.

Spring 2020

Measure Theory and Integration (Math 450)

An introduction to Lebesgue measure and integration; topology of the real numbers; inner and outer measures and measurable set; the approximation of continuous and measurable functions; the Lebesgue integral and associated convergence theorems; the Fundamental Theorem of Calculus.

Spring 2024

At the University of Pittsburgh, Pittsburgh, PA

As Instructor

Intro to Theoretical Mathematics

This course is an introduction to mathematical proofs, including discussion of mathematical notation, methods of proof, and strategies for formulating and communicating mathematical arguments. Topics covered: fundamentals of logic, sets, functions, cardinality of sets, ordered fields, completeness of $\mathbb{R}$ and its consequences, and convergence of sequences and series.

Fall 2017

Ordinary Differential Equations I
(proof-based)

This proof-based course is devoted to studying the well-posedness of nth order linear and nonlinear ordinary differential equations.

Spring 2016

Calculus I

Calculus I is the first course in the basic calculus sequence and is intended for all mathematics, engineering, science, and statistics students. Topics covered include the derivatives and integrals of functions of a single variable. A lab component in which students apply numeric, algebraic, and graphing technologies to calculus problems is an central part of the course.

Fall 2017, Fall 2016, Fall 2015

Calculus II

Calculus II is the second installment in the basic calculus sequence and is intended for all mathematics, engineering, science, and statistics students. Broadly speaking, topics covered include integration techniques, applications of the integration, sequences and series, parametric equations, polar coordinates, and an introduction to vector arithmetic and the topic of differential equations.

Spring 2018, Spring 2017, Fall 2015

At the University of Missouri, Columbia, MO

As Instructor

Calculus III

Calculus III is the last component course in the basic calculus sequence and is intended for all mathematics, engineering, science, and statistics students. Topics covered include the study of vectors, solid analytic geometry, and calculus of several variables.

Spring 2014

Ordinary Differential Equations I

This computationally-based course is devoted to studying the well-posedness of certain first and second order linear and nonlinear ordinary differential equations.

Spring 2015, Summer 2012

College Algebra

A review of exponents, order of operations, factoring, and simplifying polynomial, rational, and radical expressions. Moreover, the properties of linear, quadratic, polynomial, rational, inverse, exponential, and logarithmic functions are investigated.

Fall 2013, Spring 2011, Fall 2010, Spring 2010, Fall 2009, Spring 2009, Fall 2008

Calculus for Social and Natural Sciences

This course covers the real number system, functions, analytic geometry as well as an introduction to derivatives, integrals, and maximum-minimum problems.

Fall 2010

Summer Transitions Program

A program aimed at helping incoming freshman from underprivileged backgrounds prepare for Mathematics courses at the University of Missouri-Columbia. Includes, group work, lesson planning, test preparation, and mentoring.

Summer 2013

Service to Amherst College

Aug 2023 | Co-developer and facilitator of the "Staying in conversation with your students throughout the semester" breakout session as part of the 2023 Provost's Retreat.

Apr 2023 | Faculty panelist on the Open Curriculum Panel for the 2023 admitted student Be a Mammoth program

Jan 2023 - *present* | Campus Safety Advisory Committee (CSAC)

Spring 2020, 2024	P3 Faculty Fellow The P3 program is run by the Center for Teaching and Learning at Amherst College and its main goal is to facilitate faculty/student partnerships thinking together about teaching and learning. As a faculty fellow, I worked alongside a set of students weekly to address ongoing questions that I had about the design and structure of my course in order to determine which of my teaching methods were working well for our particular group of students and discuss other approaches we could employ to best meet the learning needs of all of the students in our class.
Dec 2020 - May 2021	Working Group to Assess the Needs of Students Learning Remotely
Jul 2020 - May 2021	Faculty Computer Committee
Mar 2020	Connecting Amherst Math Program Co-organized with Ivan Contreras (Amherst College) This is an event for underserved Amherst College and Regional High School students. Primary goals are to build a sense of community among students who share an interest in mathematics, and spread valuable information about potential careers and graduate school opportunities through invited speakers, panels, workshops, and other mathematical activities. (**postponed due to COVID**)
Aug 2019 - *present*	Faculty Liaison to Men's and Women's Squash Team
Aug 2019 - *present*	College Advising (10 first-year/orientation advisees plus 5 intensive advisees)

Service to the Department of Mathematics and Statistics at Amherst College

2023 - 2024	Math Events Subcommittee
2023 - 2024	Co-Coordinator of the Math Honors Program
2023 - 2024	Math Course Petition Subcommittee
2019-2021, 2022 - 2024	Co-Organizer of the Math Information Sessions for Perspective Math Majors
2022 - 2024	Co-Organizer of Math Table
2022 - 2023	Math Department Budget Subcommittee
2022, 2023, 2024	Tenure-line Faculty Search Committee
2018, 2020	Visiting Assistant Professor Search Committee
2022, 2023	Lecturer Search Committee
2020 - 2021	Co-Coordinator of the Math Comprehensive/Honors Qual Exam
Spring 2020	Co-Organizer of the Math Party
2024	Author of the Linear Algebra Mathematics Comprehensive/Honors Qual Exams
2020 - 2021, 2023 - 2024	Author of the Analysis Mathematics Comprehensive/Honors Qual Exams
2019 - 2020	MAA Student Chapter Advisor
2019 - 2021, 2022 - 2024	Co-grader of Mathematics Comprehensive/Honors Qual Exams
2019 - 2020	Co-Coordinator of the Math Fellows Program
2018 - *present*	Honors Thesis Advisor (3 students)
2019 - *present*	Math Major Advising (52 students in total, past and present)

2018 - 2019 | Department Minute-taker

Service to the Mathematical Community

Spring 2024 | **PhD Committee Member**
External member on the Math PhD committee for Adam Mair, University of Alabama. Dissertation Title: Bump Conditions and Compactness of Commutators

Fall 2022 | **MATCH Fellow**
MATCH is a semester-long program, directed by AIM and sponsored by MAA Tensor SUMMA, that pairs mathematicians interested in K-12 outreach with socioeconomically disadvantaged middle school classrooms. The program aims to improve historically underrepresented students' attitudes and confidence about mathematics by providing engaging mathematical experiences and meaningful opportunities to interact with practicing mathematicians, or MATCH Fellows.

Currently | Reviewer for peer-reviewed journals
International Mathematics Research Notices (IMRN), Potential Analysis, Proceedings of the AMS, Annales Academiae Scientiarum Fennicae Mathematica, Journal of Geometric Analysis, Rose-Hulman Math Journal

Aug 2019 - *present* | Local contact for the Hudson River Undergraduate Mathematics Conference

Jul 2019 | Organizer of the 2019 MathFest Peach'18's Project NExT Workshops (co-organized with Abigail Higgins)

Jul 2019 | Contributor for the Time Management/Productivity workshop at the 2019 MathFest in Cincinnati, OH.

Conferences and Scientific Sessions Organized

Oct 2024 | Special Session on Nonsmooth Analysis and Geometry. AMS Fall Eastern Sectional Meeting, University at Albany, Albany, NY. (with Matthew Badger and Lisa Naples)

Jan 2023 | Special Session on Analysis and Differential Equations at Undergraduate Institutions. 2023 Joint Mathematics Meeting, Boston, MA. (with Luda Korobenko)

Oct 2022 | Special Session on Nonsmooth Analysis and Geometry. AMS Fall Eastern Sectional Meeting. University of Massachusetts-Amherst, Amherst, MA. (with Armin Schikorra)

Jan 2022 | Special Session on Analysis in Metric Spaces (a Mathematics Research Communities Session). 2022 Joint Mathematics Meeting, Seattle, WA (with Chris Gartland, Silvia Ghinassi, and Ilmari Kangasniemi)

Mar 2017 | Analysis on Metric Spaces. Department of Mathematics, University of Pittsburgh, Pittsburgh, PA (with Piotr Hajlasz)

Mentoring

Aug 2018 - *present* | Math Alliance Mentor
Math Alliance Mentors are faculty who have committed themselves to mentoring and encouraging undergraduate students from backgrounds that are typically underrepresented in the quantitative sciences. Mentors nominate Math Alliance Predoctoral Scholars, serve on the mentoring team for these Scholars, and are active members of the Math Alliance Community, providing leadership and guidance for its members.

Aug 2017 - Dec 2017	Graduate Teaching Assistant Mentoring in the Mathematics Department at The University of Pittsburgh, Pittsburgh, PA
Aug 2011 - May 2012	Teaching Assistant Advisor in the Mathematics Department at The University of Missouri, Columbia, MO

Professional Development

Jun 2020 - Jun 2021 | Math Research Communities (MRC) Program in Analysis in Metric Spaces

The MRC is a professional development program run by the American Mathematical Society and is aimed at offering early-career mathematicians a rich array of opportunities to develop collaborative research skills, build a network focused in an active research domain, and receive mentoring from leaders in that area.

Jun 2019 | Research Experiences for Undergraduate Faculty (REUF) Program

REUF is a week-long workshop that encourages and supports involvement in research with undergraduates by faculty at colleges and universities which emphasize undergraduate education. The underlying goal of this workshop is to not only build a research program that is accessible to undergraduate students, but also to develop a community of researchers that is inclusive of students from underrepresented groups, including students with disabilities, and/or first generation college students.

Aug 2018 - Aug 2019 | Project NExT (New Experiences in Teaching) Program

This professional development program, offered by the Mathematical Association of America, addresses all aspects of an academic career: improving the teaching and learning of mathematics, engaging in research and scholarship, finding exciting and interesting service opportunities, and participating in professional activities.

Aug 2018 | Achievement in Pedagogy Certificate from The Center of Teaching and Learning at the University of Pittsburgh

Courses taken in support of this certificate: "Encouraging Student Participation", "Teaching Inclusively", "Digital Participation: Using Audience Response Systems to Enhance Your Classroom", "Teaching Abstract Concepts", "Teaching Effectively with and without PowerPoint", "Teaching International Students", "Bringing Your Classroom to Life: Communication and Creativity"

Aug 2017 - Dec 2017 | "Large Enrollment Learning Community"

A cohort comprised of faculty members from University of Pittsburgh that explores ways of implementing the most effective teaching strategies into a large enrollment class. Some sessions include "Using online quizzes in Blackboard to gauge student learning", "Conducting group work in large enrollment courses", and "Assessment techniques for large enrollment courses".

Aug 2015 - Jul 2018 | Discipline-based Science Education Research Center (dB-SERC)

Workshops at The University of Pittsburgh focused on learning new and effective approaches to teaching through evidence-based practices.

Apr 2015, Mar 2018 | Latinos in the Mathematical Sciences Conference

The goal of the conference was to encourage Latinos, as well as other minority groups, to pursue careers in the mathematical sciences, to promote the advancement of minorities currently in the discipline, and to build a community around shared academic interests.

Professional Memberships

Currently	American Mathematical Society (AMS)
Currently	Mathematical Association of America (MAA)

Currently	Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS)
Currently	Association for Women in Mathematics (AWM)
Aug 2015 - Aug 2018	University of Pittsburgh Hispanic and Latino Professional Association
Aug 2004 - May 2008	Kappa Mu Epsilon, Mathematics Honors Society Treasurer of the William Jewell Chapter (2007)
Aug 2004 - May 2008	Sigma Pi Sigma, Physics Honors Society Vice President of the William Jewell Chapter (2007)

Honors, Awards, and Funding

Jul 2021 - Jul 2022	Amherst College Trustee Faculty Fellowship Each year the College awards up to two Trustee Faculty Fellowships (based on recommendation by the Board of Trustees, the President, and the Committee of Six) to untenured members of the Faculty on the basis of a proposal for a Tenure-Track Sabbatical Fellowship. In 2020, there were a total of 17 applications under consideration.
Aug 2018 - Aug 2019	Project NExT Fellowship (Peach '18) Full support to attend the Mathematical Association of America's Project NExT program.
2018	Provost's Personalized Education Seed Grant, (co-PI - Univ. of Pittsburgh) USD 26,306
2018	dB-Serc Course Tansformation Award (co-PI - Univ. of Pittsburgh) USD 9,999
May 2011	Excellence in Teaching Award, (University of Missouri) Awarded annually to top five graduate student instructors
Aug 2010	Meritorious Performance on the Analysis Ph.D. Qualifying Exam Awarded to the student with the top examination score
Aug 2008	Thurgood Marshall Fellowship Awarded to promising students from under-represented ethnic groups
May 2008	Inducted into the Phi Epsilon Honor Society Society for students graduating in the top 10% of their class
May 2007	Wallace Hilton Scholarship ($2,270)
May 2006	James Eaton Scholarship ($1,300)
May 2005	CD Geilker Scholarship ($500)
May 2004 - May 2007	Academic Excellence Scholarship ($3,500 per year)