Eric Ramos - Curriculum Vitae

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Pronouns	He/Him/His

Education

2017	Ph.D. Mathematics - University of Wisconsin, Madison Advisor - *Jordan Ellenberg*
2012	M.S. Mathematics - Carnegie Mellon University
2012	B.S. Mathematics - Carnegie Mellon University

Employment

2023 - Present	Assistant Professor - Stevens Institute of Technology
2021 - 2023	Assistant Professor - Bowdoin College
2020 - 2021	Paul Olum Postdoctoral Fellow - University of Oregon Mentor - *Nicholas Proudfoot*
2018 - 2020	NSF Postdoctoral Fellow - University of Oregon Mentor - *Nicholas Proudfoot*
2017 - 2018	NSF Postdoctoral Fellow - University of Michigan Mentor - *Andrew Snowden*

Awards and Honors

- National Science Foundation LEAPS-MPS grant DMS-2137628, September 2021 - September 2024
- SIAM Early career travel award, July 2019
- Oberwolfach Simons Visiting Professorship (declined), January 2018.
- U.S. Junior Oberwolfach Fellow, January 2018.
- National Science Foundation Postdoctoral Fellowship, September 2017 - August 2020.
- University of Wisconsin Advanced Opportunities Fellowship, January 2017 - August 2017.
- University of Wisconsin Excellence in Mathematical Research Award, May 2017.
- University of Wisconsin Mathematics Graduate Teaching Award, May 2014.
- Carnegie Mellon University Honors, May 2012.
- Mellon College of Science Research Honors, May 2012.

Preprints

- M. Bate, B. Everitt, S. Ford, and E. Ramos, **Homology of matching complexes and representations of symmetric groups**, Submitted, arXiv:2312.13750
- I. Flynn, E. Ramos, and B. Young, **Representation stability in the intrinsic hyperplane arrangements associated to irreducible representations of the symmetric-groups**, Submitted, arXiv:2405.13291
- D. Guan and E. Ramos, **Independence numbers in certain families of highly symmetric graphs**, Submitted, arXiv:2401.16739
- L. Caputi, C. Collari, and E. Ramos, **The weak categorical quiver minor theorem and its applications: matchings, multipaths, and magnitude cohomology**, Submitted, arXiv:2401.01248.
- E. Ramos, and G. White, **Families of Markov chains with compatible symmetric-group actions**, Submitted, arXiv:1810.08475.

Papers

- E. Ramos, and G.White, **Excessive symmetry can preclude cutoff**, To Appear, *Linear Algebra and its Applications*, arXiv:2109.10281.
- B. Knudsen and E. Ramos, **Robertson's conjecture and universal finite generation in the homology of graph braid groups**, To Appear, *Selecta Mathematica*, arXiv:2305.19363.
- B. Knudsen and E. Ramos, **Robertson's conjecture in algebraic topology**, *Séminaire Lotharingien de Combinatoire*, 89B.49 (2023), 11 pp. FPSAC 2023.
- B. Pawlowski, E. Ramos, and B. Rhoades, **Spanning subspace configurations and representation stability**, *The Electronic Journal of Combinatorics, P1-7*, arXiv:1907.07268.
- N. Proudfoot, and E. Ramos, **The contraction category of graphs**, *Representation Theory of the American Mathematical Society* 26, no. 23 (2022): 673-697, arXiv:1907.11234.
- E. Ramos, **The graph minor theorem in algebra**, *Notices of the American Mathematical Society*, September 2022.
- D. Miyata, and E. Ramos, **The graph minor theorem in topological combinatorics**, *Advances in Mathematics*, 430 (2023) arXiv:2012.01679.
- J. Matherne, D. Miyata, N. Proudfoot, and E. Ramos, **Equivariant log concavity and representation stability**, *International Math Research Notices (IMRN)*, arXiv:2104.00715.
- N. Proudfoot, and E. Ramos, **Stability phenomena for resonance arrangements**, *Proceedings of the American Mathematical Society, Series B*, 8.18 (2021): 219-223, arXiv:2011.01323.
- E. Ramos, **Hilbert series in the category of trees with contractions**, *Mathematische Zeitschrift* (2021): 1-22 arXiv:2007.05669.
- D. Levin, E. Ramos, and B. Young, **A module for random braiding in graph configuration spaces**, to appear, *International Math Research Notices (IMRN)*, arXiv:2004.00674.
- B. Pawlowski, E. Ramos, and B. Rhoades, **Spanning Configurations and Matroidal Representation Stability**, *Séminaire Lotharingien de Combinatoire*,84B.57 (2020), FPSAC 2020.
- N. Proudfoot, and E. Ramos, **Functorial invariants of trees and their cones**, *Selecta Mathematica* 25.4 (2019) 62., arXiv:1903.10592.
- E. Ramos, **An application of the theory of FI-algebras to graph configuration spaces**, *Mathematische Zeitschrift*, (2019) 1-15, arXiv:1805.05316.
- E. Ramos, D. Speyer, and G. White, **FI-sets with relations**, *Algebraic Combinatorics*, 3(5), 1079-1098, arXiv:1804.04238.
- L. Li and E. Ramos, **Local cohomology and the Multigraded regularity of $\mathbf{FI}^m$-modules**, *Journal of Commutative Algebra* 13.2 (2021): 235-252. arXiv:1711.07964.

- E. Ramos and G. White, **Families of nested graphs with compatible symmetric-group actions**, *Selecta Mathematica* 25.5 (2019) 70, arXiv:1711.07456.
- E. Ramos, **Asymptotic behaviors in the homology of symmetric group and finite general linear group quandles**, *Journal of Pure and Applied Algebra*, Volume 222, Issue 12, December 2018, 3858-3876, arXiv:1706.02809.
- E. Ramos, **Configuration spaces of graphs with certain permitted collisions**, *Discrete and Computational Geometry*, (2017) 1-33, arXiv:1703.05535
- E. Ramos, **Stability phenomena in the homology of tree braid groups**, *Algebraic and Geometric Topology*, 18 (2018), 2305-2337, arXiv:1609.05611.
- E. Ramos, **On the degree-wise coherence of $\mathbf{FI}_G$-modules**, *New York Journal of Mathematics* 23 (2017), 873-896, arXiv:1606.04514.
- E. Ramos, **Generalized Representation Stability and $\mathbf{FI}_d$-modules**, *Proc. Amer. Math. Soc.* 145 (2017), 4647–4660, arXiv:1606.02673.
- L. Li and E. Ramos, **Depth and the local cohomology of $\mathbf{FI}_G$-modules**, *Advances in Mathematics*,329 (2018), 704-741, arXiv:1602.04405.
- E. Ramos, **Homological invariants of FI-modules and $\mathbf{FI}_G$-modules**, *Journal of Algebra* 502 (2018), 163-195, arXiv:1511.03964.
- T. Feng, K. James, C. Kim, E. Ramos, C. Trentacoste and H. Xue, **Three Selmer Groups For Elliptic Curves With 3-Torsion**, *The Ramanujan Journal: Volume 31, Issue 3* (2013), Page 435-459.
- S. Bigelow, E. Ramos and R. Yi, **The Alexander and Jones Polynomials Through Representations of Rook Algebras**, *The Journal Of Knot Theory and its Ramifications* 21 no. 12 (2012), 18pp, arXiv:1110.0538.

Talks

- Workshop in Configuration Spaces and Related Topics at Kyungpook National University, August 2024
- Atlanta Lecture Series in Combinatorics and Graph Theory, March 2024
- JMM Special Session on Modern Developments in the Theory of Configuration Spaces, January 2024
- Stevens ACC Seminar, November 2023
- University of Florida Combinatorics Seminar, October 2023
- FPSAC 2023, July 2023
- Stevens Institute of Technology Mathematics Colloquium, May 2023
- Carnegie Mellon University Undergraduate Mathematics Colloquium, February 2023
- Barnard College Mathematics Colloquium, January 2023
- Baruch College Mathematics Colloquium, January 2023
- Bowdoin College Mathematics Faculty Seminar, November 2022
- Bowdoin College Mathematics Undergraduate Colloquium, October 2022
- AMS Special Session: Latinx and Hispanics in Combinatorics, Number Theory, Geometry and Topology, October 2022
- WARTHOG at the University of Oregon (Teaching Assistant), June 2022
- Carnegie Mellon ACO seminar, April 2022
- AMS Special Session: Geometric and Topological Combinatorics, April 2022
- University of Massachusetts - Amherst Topology Seminar, March 2022

- Bowdoin College Mathematics Faculty Seminar, March 2022
- University of Wisconsin - Madison Algebraic Geometry Seminar, November 2021
- Workshop in Compactifications, configurations, and cohomology, October 2021
- SIAM AG 2021 - Asymptotic phenomena in algebra and statistics, August 2021
- Fields Institute - Workshop on Progress and Open Problems in Rigidity Theory, April 2021
- Wake Forest Math Colloquium, February 2021
- Bowdoin Math Colloquium, February 2021
- UT Austin Math Colloquium, February 2021
- Washington and Lee Math Colloquium, January 2021
- Notre Dame Math Colloquium, January 2021
- Texas A& M Math Colloquium, November 2020
- TAPIRS (Virtual), September 2020, `https://www.youtube.com/watch?v=EgFg15GM8JU`
- University of Texas - Austin Geometry seminar (Virtual), September 2020
- AMS special session on geometric advances in representation stability (Virtual), May 2020
- Arrangements at Home I: combinatorial aspects (Virtual), May 2020
- Ohio State Math Colloquium, February 2020
- AIM Workshop on Configuration Spaces of Graphs, February 2020
- Temple Math Colloquium, December 2019
- Northeastern Topology Seminar, November 2019
- Fall 2019 Western Algebraic Geometry Symposium, November 2019
- SIAM AG 2019 - Asymptotic phenomena in algebra and statistics, July 2019
- University of California - San Diego Combinatorics Seminar, May 2019
- Indiana University - Bloomington Algebra Seminar, April 2019
- Brown Combinatorics Seminar, April 2019
- AMS Special Session: Combinatorics in Algebra and Algebraic Geometry, October 2018
- University of Oregon Geometry and Topology Seminar, October 2018
- Michigan Representation Stability Week 2018, August 2018.
- NSF/PIMS Summer School: The Roots of Topology, June 2018 (lightning talk)
- Notre Dame Algebraic Geometry/Commutative Algebra Seminar, April 2018
- Purdue University Topology Seminar, March 2018
- University of Chicago Geometry/Topology Seminar, February 2018
- University of Michigan Combinatorics Seminar, February 2018
- University of Michigan Representation Stability Seminar, February 2018
- Mathematisches Forschungsinstitut Oberwolfach: Topology of Arrangements and Representation Stability, January 2018
- AMS Special Session: Representation Stability and its Applications, April 2017

- University of Michigan Representation Stability Seminar, March 2017
- University of Wisconsin Combinatorics Seminar, January 2017
- Stanford University Topology Seminar, January 2017
- Upper Midwest Commutative Algebra Colloquium, November 2016
- University of Minnesota Commutative Algebra Seminar, October 2016
- Banff International Research Station: Asymptotic Algebra, Syzygies, and Representation Theory, April 2016
- University of Wisconsin Algebraic Geometry Seminar, March 2016
- University of Wisconsin Algebraic Geometry Seminar, November 2015
- University of Wisconsin Combinatorics Seminar, October 2015
- University of Wisconsin Combinatorics Seminar, January 2015

Teaching

Stevens Institute of Technology

- Vectors and Matrices / Multivariable Calculus (MA 125/126) - Instructor (Spring 2024)
- Fundamental Mathematics for Data Science (MA 574) - Instructor (Fall 2023)

Bowdoin College

- Reading Course in Algebraic Topology (Math 4029) - Instructor (Spring 2023)
- Combinatorics and Graph Theory (Math-2601) - Instructor (Spring 2023)
- Probability (Math-2206) - Instructor (Spring 2023)
- Reading Course in Algebraic Geometry (Math-4029) - Instructor (Fall 2022)
- Intermediate Linear Algebra (Math-2305) - Instructor (Fall 2022)
- Linear Algebra (Math-2000) - Instructor (Fall 2022)
- Probability (Math-2206) - Instructor (Spring 2022)
- Linear Algebra (Math-2000) - Instructor (Fall 2021)
- Combinatorics and Graph Theory (Math-2601) - Instructor (Fall 2021)

University of Oregon

- Advanced Calculus III (Math-263) - Instructor (Spring, 2021)
- Stochastic Processes (Math-467/Math-567) - Instructor (Winter, 2021)
- Advanced Calculus II (Math-262) - Instructor (Winter, 2021)
- Advanced Calculus I (Math-261) - Instructor (Fall, 2020)
- Discrete Mathematics II (Math-232) - Instructor (Spring, 2020)
- Linear Algebra (Math-341) - Instructor (Fall, 2019)
- Calculus 2 (Math-252) - Instructor (Winter, 2018)
- Calculus 1 (Math-251) - Instructor (Fall, 2018)

University of Wisconsin - Madison

- Techniques in Ordinary Differential Equations (MATH-319) - Teaching Assistant (Fall, 2016)
- Algebra Summer Enhancement Program† - Instructor (Summer, 2016)
- Algebra Summer Enhancement Program - Instructor (Summer, 2015)
- Calculus (MATH-211) - Teaching Assistant (Fall, 2014)
- Calculus and Introduction to Differential Equations (MATH-213) - Teaching Assistant (Fall, 2013)
- Calculus with Algebra and Trigonometry II (MATH-217) - Teaching Assistant (Spring 2013)
- Calculus and Analytic Geometry (MATH-221) - Teaching Assistant (Fall, 2012)

† The Summer Enhancement Program is a month long course designed to prepare early graduate students for the qualifying exam in the stated subject.

Ph.D. and Masters Students

- Joshua Birns, September 2024 - August 2030.
- Anthony Lin, January 2024 - August 2028.

Other Advising/Mentorship

- Jonathan Mathew Mpungu Nalikka, September 2023 - May 2024. Supervised a year long in-semester REU on graph categories and algebras through CUNY York College
- Adityo Mamun, September 2023 - May 2024. Supervised a year long in-semester REU on graph categories and algebras through CUNY York College
- Jenaro Galan Prieto, September 2023 - May 2024. Supervised senior thesis work in combinatorics and graph theory related with the zero forcing problem.
- David Guan, June 2023 - August 2023. Participated in a Summer long research project related with the combinatorics and algebra of families of highly symmetric graphs.
- Juntao Lu, June 2022 - August 2022. Participated in a Summer long research project related with Markov chains, topology, and random processes on graph configuration spaces.
- Zach Flood, June 2022 - August 2022. Participated in a Summer long research project related with Markov chains, topology, and random processes on graph configuration spaces.
- Gabriela Perez Villalobos, August 2020 - December 2020, through Científico Latino's Graduate Student Mentorship Initiative (GSMI). Advised and oversaw the student's process applying to graduate school in mathematics.
- Dane Miyata (Co-advised with N. Proudfoot), September 2019 - August 2021.
- Sho Kawakami, September 2015 - May 2017, through the Wisconsin Directed Reading Program. Read in topological and combinatorial graph theory, as well as algebraic and enumerative combinatorics.