Curriculum Vitae of David Galvin

June 12, 2025

Department of Mathematics
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WEBSITES

- Professional webpage http://nd.edu/~dgalvin1/
- ArXiv.org https://arxiv.org/a/galvin_d_1.html
- Google scholar https://scholar.google.com/citations?user=m3wdswkAAAAJ&hl=en
- zbMATH OPEN https://zbmath.org/authors/galvin.david-j

RESEARCH INTERESTS

Discrete probability, combinatorics and graph theory; in particular, extremal enumerative problems, set partitions, and the applications of combinatorial and probabilistic ideas to the study of phase transitions in statistical physics models and long-range correlations in discrete random structures

EDUCATION AND PROFESSIONAL PREPARATION

Predoctoral.

- Ph.D. in Mathematics, Rutgers, The State University of New Jersey, October 2002 (advisor: Jeff Kahn)
- Part III of Mathematical Tripos (M. Math.), Peterhouse, University of Cambridge, June 1996
- B.A. in Mathematics, Peterhouse, University of Cambridge, June 1995

Postdoctoral.

- Lecturer, Department of Mathematics, University of Pennsylvania, July 2005 – June 2007 (mentor: Robin Pemantle)
- Member, Mathematical Sciences Research Institute, Berkeley, January – February 2005
- Member, School of Mathematics, Institute for Advanced Study, Princeton, September 2004 – August 2005 (group leader: Avi Wigderson)
- Postdoctoral Researcher, Theory Group, Microsoft Research, July 2002 – July 2004 (managers: Jennifer Chayes & Christian Borgs)

EMPLOYMENT

Regular positions.

- Chair, Department of Mathematics, University of Notre Dame, July 2022 – present
- Professor, Department of Mathematics, University of Notre Dame, July 2020 – present
- Associate Professor, Department of Mathematics, University of Notre Dame, July 2013 – June 2020
- Assistant Professor, Department of Mathematics, University of Notre Dame, July 2007 – June 2013

Visiting/temporary positions.

- REGS (Research Experience for Graduate Students) official visitor, Department of Mathematics, University of Illinois at Urbana-Champaign, June 2011
- Visiting Fellow, Isaac Newton Institute, University of Cambridge, June 2008
- Auxiliary Faculty, Department of Mathematics, University of Washington, August – December 2003

RESEARCH PAPERS

Numbering for all research papers follows that used at https://www3.nd.edu/~dgalvin1/research.html where pdf copies may be found. Unless otherwise specified, all articles listed below are posted on the arXiv preprint server at https://arxiv.org/a/galvin_d_1.html

(*): – undergraduate at time of work
(+): – graduate student at time of work
(@): – postdoctoral researcher at time of work

Unsubmitted papers.

52: David Galvin, Trees with non log-concave independent set sequences, arXiv:2502.10654 (2025)

Submitted papers.

52: David Galvin, Trees with non log-concave independent set sequences, arXiv:2502.10654 (2025)
51: David Galvin and Phillip Marmorino(+), Counting independent sets in regular graphs with bounded independence number, arXiv:2410.19959 (2024).
50: David Galvin and Courtney Sharpe(*), Independent set sequence of some linear hypertrees, arXiv:2409.15555v2 (2024)
49: David Galvin and Yufei Zhang(+), The domination polynomial of powers of paths and cycles, arXiv:2408.12731 (2024)

Refereed papers.

48: Abdul Basit(@) and David Galvin, Generalized Tuza's conjecture for random hypergraphs, *SIAM Journal of Discrete Mathematics* **38** (2024), 2260–2288
47: John Engbers, David Galvin and Cliff Smyth, Reciprocals of thinned exponential series, *Australasian Journal of Combinatorics* **89** (2024), 61–96
46: David Galvin, Gwen McKinley(@), Will Perkins, Mihalis Sarantis(+) and Prasad Tetali, On the zeroes of hypergraph independence polynomials, *Combinatorics, Probability and Computing* **33** (2024), 65–84
45: David Galvin and Yufei Zhang(+), Totally non-negativity of a family of change-of-basis matrices *Linear Algebra and its Applications* **676** (2023), 88-103
44: David Galvin, Bailee Zacovic(*) and Greyson Wesley(*), Enumerating Threshold Graphs and Some Related Graph Classes, *J. Integer Sequences* **25** (2022), Article 22.2.7
43: Taylor Ball(+), David Galvin, Catherine Hyry(*), Kyle Weingartner(*), Independent set and matching permutations, *Journal of Graph Theory* **99** (2022), 40–57
42: Abdul Basit(@) and David Galvin, On the independent set sequence of a tree, *Electronic Journal of Combinatorics* **28** (2021), article #P3.23
41: Artem Chernikov, David Galvin and Sergei Starchenko, Cutting lemma and Zarankiewicz's problem in distal structures, *Selecta Mathematica (New Series)* **26** (2020), article #25
40: David Galvin and Adrian Pacurar(+), Total non-negativity of some combinatorial matrices, *Journal of Combinatorial Theory Series A* **172** (2020), article #105179
39: Antonio Blanca(@), Yuxuan Chen(*), Dana Randall and Prasad Tetali, Phase Coexistence for the Hard-Core Model on $\mathbb{Z}^2$, *Combinatorics, Probability and Computing* **28** (2019), 1–22
38: Teena Carroll and David Galvin, The game of plates and olives, *Electronic Journal of Combinatorics* **26** (2019), P1.18
37: John Engbers, David Galvin and Cliff Smyth, Restricted Stirling and Lah number matrices and their inverses, *Journal of Combinatorial Theory Series A* **161** (2019), 271–298
35: David Galvin and Justin Hilyard(+), The independent set sequence of some families of trees, *Australasian Journal of Combinatorics* **70** (2018), 236–252
34: John Engbers and David Galvin, Extremal H-colorings of trees and 2-connected graphs, *Journal of Combinatorial Theory Series B* **122** (2017), 800–814
32: James Carraher(+), Stephen Hartke, Jaime Radcliffe and Derrick Stolee(+), On the independence ratio of distance graphs, *Discrete Mathematics* **339** (2016), 3058–3072

31: David Galvin, Asymptotic normality of some graph sequences, *Graphs and Combinatorics* **32** (2016), 639–647

30: David Galvin, Jeff Kahn, Dana Randall Greg Sorkin, Phase coexistence and torpid mixing in the 3-coloring model on $\mathbb{Z}^d$, *SIAM Journal on Discrete Mathematics* **29** (2015), 1223–1244

29: David Galvin, Counting colorings of a regular graph, *Graphs and Combinatorics* **31** (2015), 629–638

28: John Engbers(+), David Galvin and Justin Hilyard(+), Combinatorially interpreting generalized Stirling numbers, *European Journal of Combinatorics* **43** (2015), 32–54

26: John Engbers(+) and David Galvin, Counting independent sets of a fixed size in graphs with a given minimum degree, *Journal of Graph Theory* **76** (2014), 149–168

25: Antonio Blanca(+), David Galvin, Dana Randall and Prasad Tetali, Phase Coexistence and Slow Mixing for the Hard-Core Model on $\mathbb{Z}^2$, *Lecture Notes in Computer Science* **8096** (*Proceedings of the seventeenth International Conference on Randomization and Computation (RANDOM)*) (2013), 379–394

24: David Galvin and Do Throng Thanh(*), Stirling numbers of forests and cycles, *Electronic Journal of Combinatorics* **20** (2013), #P73

23: David Galvin, Maximizing H-colorings of a regular graph, *Journal of Graph Theory* **73** (2013), 66–84

22: John Engbers(+) and David Galvin, H-coloring tori, *Journal of Combinatorial Theory Series B* **102** (2012), 1110–1133

21: David Galvin, The independent set sequence of regular bipartite graphs, *Discrete Mathematics* **312** (2012), 2881–2892

20: John Engbers(+) and David Galvin, H-colouring bipartite graphs, *Journal of Combinatorial Theory Series B* **102** (2012), 726–742

19: Peter Cholak, David Galvin and Reed Solomon, Reverse Mathematics and infinite traceable graphs, *Mathematical Logic Quarterly* **58** (2012), 18–28

18: David Galvin, Two problems on independent sets in graphs, *Discrete Mathematics* **311** (2011), 2105–2112

17: David Galvin, Fabio Martinelli, Kavita Ramanan and Prasad Tetali, The multi-state hard core model on a regular tree, *SIAM Journal on Discrete Mathematics* **25** (2011), 894–916

16: David Galvin and Yufei Zhao(*), The number of independent sets in a graph with small maximum degree, *Graphs and Combinatorics* **27** (2011), 177–186

15: David Galvin, A threshold phenomenon for random independent sets in the discrete hypercube, *Combinatorics, Probability and Computing* **20** (2011), 27–51

14: David Galvin, An upper bound for the number of independent sets in regular graphs, *Discrete Mathematics* **309** (2009), 6635–6640

13: Teena Carroll(+), David Galvin and Prasad Tetali, Matchings and Independent Sets of a Fixed Size in Regular Graphs, *Journal of Combinatorial Theory Series A* **116** (2009), 1219–1227

12: David Galvin, Sampling independent sets on the discrete torus, *Random Structures & Algorithms* **33** (2008), 356–376

11: David Galvin(@), Sampling 3-colourings of regular bipartite graphs, *Electronic Journal of Probability* **12** (2007), 481–497

10: David Galvin(@) and Dana Randall, Torpid Mixing of Local Markov Chains on 3-Colorings of the Discrete Torus, *Proceedings of the eighteenth annual ACM-SIAM Symposium on Discrete Algorithms (SODA)* (2007), 376–384

9: David Galvin(@), Bounding the partition function of spin systems, *Electronic Journal of Combinatorics* **13** (2006), #R72

8: David Galvin(@) and Prasad Tetali, Slow mixing of Glauber dynamics for the hard-core model on regular bipartite graphs, *Random Structures & Algorithms* **28** (2006), 427–443

7: Raissa D'Souza, David Galvin(@), Cristopher Moore and Dana Randall, Global connectivity from local geometric constraints for sensor networks with various wireless footprints, *5th ACM–IEEE International Symposium on Information Processing in Sensor Networks (IPSN)* (2006), 19–26

6: David Galvin(@) and Prasad Tetali, On weighted graph homomorphisms, *DIMACS Series in Discrete Mathematics and Theoretical Computer Science* **63** (2004) *Graphs, Morphisms and Statistical Physics*, 97–104

5: David Galvin(+) and Jeff Kahn, On phase transition in the hard-core model on $\mathbb{Z}^d$, *Combinatorics, Probability and Computing* **13** (2004), 137–164

4: David Galvin(@) and Prasad Tetali, Slow mixing of Glauber dynamics for the hard-core model on the hypercube, *Proceedings of the fifteenth annual ACM-SIAM Symposium on Discrete Algorithms (SODA)* (2004), 459–460

2: David Galvin(+), On homomorphisms from the Hamming cube to $\mathbb{Z}$, *Israel Journal of Mathematics* **138** (2003), 189–213

Unrefereed papers.

36: David Galvin, Independent sets in the discrete hypercube (expository article, arXiv only), arXiv:1901.01991 (2019)

33: Deeparnab Chakrabarty and David Galvin, Guest editors' foreword *Theory of Computing* **12** (2016), *Special issue: APPROX-RANDOM 2014*, Article 8

27: David Galvin, Three tutorial lectures on entropy and counting (expository article, arXiv only), arXiv:1406.7872 (2014)

3: David Galvin(@), Entropy and graph homomorphisms (extended abstract of presentation), *Oberwolfach Reports* **1** (2004), 30–32

1: David Galvin(+), Two problems involving the notion of phase transition (Ph.D. dissertation), *ProQuest Dissertations and Theses* (2002)

Sequences authored on OEIS.org. A345882, A348576, A350531, A350745, A348436, A350060, A350528, A350746, A364580

GRANTS

Current.

- Principal investigator, Simons Foundation Collaboration Grant for Mathematicians, *Explorations in combinatorial sequences*, September 2021 – August 2026

Previous.

- Principal investigator, NSF Conferences and Workshops in the Mathematical Sciences, *8th Lake Michigan Workshop on Combinatorics and Graph Theory*, March 2023 – March 2024
- American Institute of Mathematics Structured Quartet Research Ensemble (SQuaRE), *The independence polynomial of hypergraphs*, January 2021 – August 2023
- (Internal) Cluster planning grant from Provost's *Moment to See, Courage to Act* initiative, *International Community Education Project in Ireland* (with Annette Pilkington, Aaron Tyrell and Patrick Heslin), December 2021 – June 2022
- Senior Personnel, NSF Focussed research grant, *Collaborative Research: Computability-Theoretic Aspects of Combinatorics*, July 2019 – July 2023
- Principal investigator, Simons Foundation Collaboration Grant for Mathematicians, *Exploring H-colorings of graphs*, September 2015 – August 2020
- Co-Principal investigator, NSF Conferences and Workshops in the Mathematical Sciences, *6th Lake Michigan Workshop on Combinatorics and Graph Theory*, March 2019 – March 2020
- Co-Principal investigator, NSF Conferences and Workshops in the Mathematical Sciences, *5th Lake Michigan Workshop on Combinatorics and Graph Theory*, January 2018 – December 2018
- Co-Principal investigator, IMA Participating Institution Conferences, *5th Lake Michigan Workshop on Combinatorics and Graph Theory*, April 2018
- Co-Principal investigator, NSF Conferences and Workshops in the Mathematical Sciences, *Lake Michigan Workshops on Combinatorics and Graph Theory*, January 2017 – December 2018 (Collaborative grant with Western Michigan University; initially only 2017 workshop at Western Michigan was funded)

- Co-Principal investigator, NSF Conferences and Workshops in the Mathematical Sciences, *3rd–5th Lake Michigan Workshop on Combinatorics and Graph Theory* January 2016 – December 2018 (Collaborative grant with Western Michigan University and Purdue University; initially only 2016 workshop at Purdue was funded)
- Co-Principal investigator, NSF Conferences and Workshops in the Mathematical Sciences, *2nd Lake Michigan Workshop on Combinatorics and Graph Theory*, February 2015 – February 2016
- Principal investigator, NSA Mathematical Sciences Program (Young Investigators Grant), *Structural and enumerative aspects of graph homomorphisms*, May 2013 – May 2015
- Principal investigator, Simons Foundation Collaboration Grant for Mathematicians, *Structural and enumerative aspects of graph homomorphisms*, September 2012 – August 2013 (five year grant terminated after one year due to receipt of NSA grant)
- Principal investigator, NSA Mathematical Sciences Program (Young Investigators Grant), *Phase transitions for spin models on percolation clusters*, March 2010 – March 2012

HONORS AND AWARDS

- Rev. Edmund P. Joyce C.S.C. Award for Excellence in Undergraduate Teaching, University of Notre Dame, May 2017
- Father James L. Shilts/Doris and Gene Leonard Teaching Award, College of Science, University of Notre Dame, May 2016
- Good Teaching Award, Department of Mathematics, University of Pennsylvania, December 2006
- Graduate School Fellowship, Rutgers, The State University of New Jersey, August 2001 – July 2002
- Scholar of Peterhouse, University of Cambridge, September 1993 – June 1995
- Represented Ireland at International Mathematical Olympiad, July 1990

INVITED RESEARCH PRESENTATIONS SINCE JULY 2007

Plenary talks.

- 23rd Triangle Lectures in Combinatorics, North Carolina State University, November 18 2023, *Counting independent sets and colorings*
- Graduate Student Combinatorics Conference 2023, Washington University in St. Louis, March 17 2023, *Reciprocals of thinned exponentials*
- 58th Midwest Graph Theory Conference, Grand Valley State University (2 talks), October 6-7 2017, *Equilateral and almost-equilateral sets in* $\mathbb{R}^n$ and *Plates, olives, and Morse theory*
- 1st Lake Michigan Workshop on Combinatorics and Graph Theory, Western Michigan University (3 talks), March 16 2014, *Entropy & Counting Parts I, II & III* (tutorial lectures)

Colloquia.

- Undergraduate Colloquium, Department of Mathematics, Kalamazoo College, May 1 2024, *Envy-free division*
- Department of Mathematics and Statistics, University of North Carolina at Greensboro, March 29, 2023, *Reciprocals of thinned exponentials*
- Department of Mathematics and Statistics, University of North Carolina at Greensboro, February 2, 2022, *Stirling numbers and the normal order problem*
- Department of Mathematics, University of South Carolina, February 20, 2020, *Stirling numbers and the normal order problem*
- Department of Mathematics and Statistics, Georgia State University, April 19 2019, *Plates, olives, and Morse theory*
- Department of Mathematics, University of Nebraska, October 20 2017, *Plates, olives, and Morse theory*
- Department of Mathematics, University of South Carolina, March 16 2017, *Independent sets in regular graphs* (Combinatorics "Super Seminar")

- Department of Mathematics and Statistics, Loyola University, October 26 2015, *Envy-free division* (undergraduate colloquium)
- Department of Mathematics, Iowa State University, November 4 2014, *Generalized Stirling numbers and the normal ordering problem*
- Department of Mathematics and Statistics, University of North Carolina at Greensboro, January 11 2013, *Taxi walks and the hardcore distribution on* $\mathbb{Z}^2$
- Department of Mathematics, University of Nebraska, March 2 2012, *Unimodality, log-concavity and asymptotic normality of combinatorial sequences*
- Department of Mathematics, Western Michigan University, April 14 2011, *Counting graph homomorphisms: some results and questions*
- Department of Applied Mathematics, Illinois Institute of Technology, April 11 2011, *Hard-constraint spin systems: some results and questions*

Conference presentations.

- 10th Canadian Discrete and Algorithmic Mathematics Conference, University of Ottawa , Minisymposium on Graph Polynomials, May 23 2025, *The independent set polynomial of a tree*
- MAA Mathfest, Indianapolis, Indiana, Invited Paper Session: Matching and Labelings in Graphs, August 9 2024, *Matching permutations of graphs*
- AMS Sectional Meeting, University of South Alabama, Mobile, Special Session on Extremal and Probabilistic Combinatorics, October 14 2023, *Tuza's conjecture for random hypergraphs*
- TetFest60 (in honor of Prasad Tetali's 60th birthday), Georgia Tech, September 10 2023, *Two favourite problems*
- 8th Canadian Discrete and Algorithmic Mathematics Conference, held online, Minisymposium on Graph Polynomials, May 26 2021, *The independence polynomial of the random tree*
- AMS–MAA Joint Mathematics Meetings, Denver, Special Session on Analytic and Probabilistic Combinatorics, January 16 2020, *Inverses and reciprocals of thinned exponential series*
- AMS Sectional Meeting, University of Florida, Gainesville, Special Session on Extremal and Probabilistic Combinatorics, November 2 2019, *Matching permutations*
- AMS Sectional Meeting, University of Wisconsin – Madison, Special Session on Extremal Graph Theory, September 14 2019, *Independent set permutations and matching permutations*
- International Conference on Advances in Interdisciplinary Statistics and Combinatorics, University of North Carolina at Greensboro, Session on Recent Results in Combinatorics, October 6 2018, *Total Non-negativity of Some Combinatorial Matrices*
- AMS Sectional Meeting, The Ohio State University, Special Session on Probabilistic and Extremal Graph Theory, March 18 2018, *Chordal graphs, Stirling numbers and total non-negativity*
- AMS–MAA Joint Mathematics Meetings, San Diego, Special Session on Emergent Phenomena in Discrete Models, January 12 2018, *The non-locality of graph coloring*
- AMS Sectional Meeting, University of St. Thomas (Minneapolis), Special Session on Probabilistic and Extremal Combinatorics, October 29 2016, *Restricted Stirling and Lah numbers, and their inverses*
- Banff International Research Station Workshops, Workshop in Analytic and Probabilistic Combinatorics, October 27 2016, *Restricted Stirling and Lah numbers, and their inverses*
- AMS Sectional Meeting, North Dakota State University, Special Session on Extremal and Probabilistic Combinatorics, April 17 2016, *Long-range influence in colorings of the cube*
- AMS Sectional Meeting, North Dakota State University, Special Session on Extremal Graph Theory, April 16 2016, *Maximizing colorings of a regular graph — results and questions* (40-minute talk)
- AMS Sectional Meeting, University of Memphis, Special Session on Probabilistic Combinatorics, October 17 2015, *Asymptotic normality of restricted Stirling numbers*
- AMS Sectional Meeting, University of Nevada, Las Vegas, Special Session on Extremal and Structural Graph Theory, April 19 2015, *The extremal enumerative question for colouring* (45 minute talk)

- AMS Sectional Meeting, Michigan State University, Special Session on Extremal Graph Theory: Hypergraphs, Directed Graphs, and Other Generalizations, March 15 2015, *H-colouring trees*
- 2013–2014 Warwick EPSRC Symposium on Statistical Mechanics, University of Warwick, Workshop on Phase transitions in discrete structures and computational problems, May 8 2014, *Taxi Walks and the Hard Core Model on $\mathbb{Z}^2$*
- AMS Sectional Meeting, University of Louisville, Special Session on Extremal Graph Theory, October 5 2013, *Stirling numbers of graphs, and the normal ordering problem*
- 17th International Workshop on Randomization and Computation (RANDOM'2013), University of California – Berkeley, August 22 2013, *Phase Coexistence and Slow Mixing for the Hard-Core Model on $\mathbb{Z}^2$*
- 4th Canadian Discrete and Algorithmic Mathematics Conference, Memorial University of Newfoundland, Minisymposium on Probabilistic Combinatorics, June 12 2013, *Colouring regular bipartite graphs, cubes and grids*
- AMS Sectional Meeting, Iowa State University, Special Session on Graphs, Hypergraphs and Counting, April 27 2013, *Counting colorings of a regular graph*
- AMS Sectional Meeting, University of Colorado Boulder, Special Session on Extremal Graph Theory, April 13 2013, *Some extremal questions for independent sets*
- EXCILL2: Extremal Combinatorics at Illinois, University of Illinois at Urbana-Champaign, March 17 2013, *Some extremal questions for coloring*
- SIAM Conference on Discrete Mathematics (DM12), Dalhousie University (Halifax, Nova Scotia), Minisymposium on Graph Coloring, June 20 2012, *Graph Stirling numbers*
- Workshop on Computation and Phase Transitions, Georgia Institute of Technology, June 5 2012, *Proper q-colourings of the cube*
- AMS Sectional Meeting, University of South Florida, Special Session on Extremal Combinatorics, March 10 2012, *The independent set profile in graphs with given minimum degree*
- AMS Sectional Meeting, University of Nebraska, Special Session on Extremal and Probabilistic Combinatorics, October 16 2011, *Counting graph homomorphisms*
- AMS Sectional Meeting, Wake Forest University, Special Session on New Developments in Graph Theory, September 25 2011, *Graph Stirling numbers*
- AMS Sectional Meeting, University of Iowa, Special Session on Graph Theory, March 18 2011, *Unimodality of the independent set sequence of a graph*
- AMS Sectional Meeting, Syracuse University, Special Session on Analytic Combinatorics, October 2 2010, *Unimodality (and otherwise) of some graph theoretic sequences*
- AMS Sectional Meeting, New Jersey Institute of Technology, Special Session on Graph Theory, May 23 2010, *The typical structure of H-colourings of regular bipartite graphs*
- AMS Sectional Meeting, Florida Atlantic University, Special Session on Graph Theory, October 30 2009, *The number of independent sets in graphs with small maximum degree*
- DIMACS Workshop on Discrete Mathematics and Statistical Mechanics, Rutgers, The State University of New Jersey, December 18 2008, *A threshold phenomenon for independent sets in the hypercube*
- AMS Sectional Meeting, Indiana University, Special Session on Probability and Spatial Systems, April 6 2008, *Sampling 3-colourings of the discrete torus*

Seminars.

- Atlantic Graph Theory Seminar (online, based in Canada), October 30 2024, *Unimodality of some graph polynomials*
- Discrete Mathematics Seminar, University of South Carolina, November 17 2023, *Counting independent sets and colorings*
- REU Seminar, Grand Valley State University, July 15 2022, *Stirling numbers and generalizations*
- Discrete Mathematics Seminar, University of South Carolina, April 15 2022, *Plates, Olives and Morse Theory*

- Pi Mu Epsilon/Gamecock Math Club talk, University of South Carolina, April 15 2022, *Envy-free division*
- Algebra, Number Theory, Combinatorics & Geometry Seminar, University of North Carolina at Greensboro, October 22 2021, *Matching permutations and independent set permutations*
- Discrete Mathematics Seminar, Illinois Institute of Technology, April 9 2021, *Matching permutations and independent set permutations*
- Discrete Mathematics Seminar, University of Nebraska — Lincoln, November 3 2020, *The independent set sequence of a tree*
- Discrete Mathematics Seminar, University of South Carolina, October 2 2020, *Matching permutations and independent set permutations*
- Discrete Math Seminar, Rutgers, The State University of New Jersey, March 9 2020, *Matching permutations and independent set permutations*
- Discrete Mathematics Seminar, University of South Carolina, February 21 2020, *Total non-negativity of some combinatorial matrices*
- Pi Mu Epsilon (math club) talk, University of South Carolina, February 21 2020, *The other* 4*-color conjecture*
- Combinatorics Seminar, University of Michigan, October 4 2019, *Total non-negativity of some combinatorial matrices*
- Graph Theory Seminar, Georgia Institute of Technology, April 18 2019, *Independent set permutations, and matching permutations*
- Combinatorics Seminar, Western Michigan University, November 8 2018, *Total non-negativity of generalized Stirling matrices*
- Mathematical Computer Science Seminar, University of Illinois at Chicago, October 29 2018, *Total non-negativity of generalized Stirling matrices*
- Math Club talk, University of Nebraska, October 19 2017, *Equilateral and almost equilateral sets*
- Combinatorics Seminar, University of South Carolina, March 17 2017, *Taxi walks and the hard-core model on* $\mathbb{Z}^2$
- Combinatorics Seminar, Michigan State University, November 22 2016, *Restricted Stirling and Lah numbers, and their inverses*
- Graph Theory Seminar, Western Michigan University, November 2 2016, *Restricted Stirling and Lah numbers, and their inverses*
- Graph Theory Seminar, Western Michigan University, December 4 2015, *The cube-indexed random walk*
- Mathematics Seminar, Grand Valley State University, October 30 2014, *300 years of Stirling numbers*
- Combinatorics seminar, Michigan State University, April 22 2014, *Generalized Stirling numbers and the normal ordering problem*
- Combinatorics and Probability Seminar, The Ohio State University, February 13 2014, *Entropy and Counting*
- Graph Theory Seminar, Western Michigan University, February 6 2013, *Asymptotic normality and graph Stirling numbers*
- Probability Seminar, Purdue University, September 25 2012, *Taxi walks and the hardcore distribution on* $\mathbb{Z}^2$
- Analytic Combinatorics Seminar, Purdue University, April 6 2012, *Graph Stirling Numbers*
- Graph Theory Seminar, Western Michigan University, November 29 2011, *An extremal problem for independent sets*
- Graph Theory & Combinatorics Seminar, University of Illinois at Urbana-Champaign, June 29 2011, *Entropy and Counting*
- Graph Theory & Combinatorics Seminar, University of Illinois at Urbana-Champaign, June 27 2011, *Unimodality of combinatorial sequences*
- Graduate Student Seminar, Illinois Institute of Technology, April 11 2011, *Brégman's theorem and extensions*

- Discrete Mathematics Seminar, University of Delaware, March 2 2011, *Unimodality (and otherwise) of some graph theoretic sequences*
- Combinatorics Seminar, Georgia Institute of Technology, December 15 2010, *Unimodality (and otherwise) of some graph theoretic sequences*
- Graph Theory & Combinatorics Seminar, University of Illinois at Urbana-Champaign, April 27 2010, *The typical appearance of colourings of regular bipartite graphs*
- Combinatorics Seminar, University of Illinois at Chicago, March 11 2009, *A threshold phenomenon for independent sets in the hypercube*
- Combinatorics, Optimization & Algorithms Seminar, Carnegie Mellon University, December 4 2008, *Counting matchings and independent sets of a fixed size*

OTHER RESEARCH PRESENTATIONS SINCE JULY 2007

Contributed conference presentations.

- AMS Sectional Meeting, University of Connecticut (Hartford), Special Session on Recent Trends on Graphs and Hypergraphs, April 6 2025, *The Dominating set sequence of powers of paths and powers of cycles*
- AMS Sectional Meeting, University of Utah, Special Session on Graphs, Hypergraphs and Sets Systems, October 23 2022, *Eulerian numbers and TNN matrices*
- 19th British Combinatorial Conference, University of Birmingham (UK), July 31 2019, *Independent set permutations and matching permutations*
- 43rd Annual Mathematics Conference (Combinatorics and its Applications), Miami University (Ohio), September 26 2015, *Asymptotic Normality of Restricted Stirling Numbers*
- AMS Sectional Meeting, University of North Carolina at Greensboro, Special Session on Recent Developments in Graph Theory and Hypergraph Theory, November 9 2014, *The independent set sequence of trees*
- 56th Midwest Graph Theory Conference, Purdue University Fort Wayne, October 4 2014, *The independent set sequence of trees*
- 54th Midwest Graph Theory Conference, Miami University (Ohio), April 6 2013, *Twin conventions and graph Stirling numbers*
- 53rd Midwest Graph Theory Conference, Iowa State University, September 22 2012, *Taxi walks and the hard-core distribution on* $\mathbb{Z}^2$
- 52nd Midwest Graph Theory Conference, Indiana State University, April 11 2012, *Counting colorings of regular graphs*
- 15th International Conference on Random Structures and Algorithms, Emory University, May 27 2011, *The typical appearance of a colouring of a regular bipartite graph*
- 24th Cumberland Conference on Graph Theory, Combinatorics and Computing, University of Louisville, May 12 2011, *Independent sets in graphs with given minimum degree*
- SIAM Conference on Discrete Mathematics (DM10), Austin, Session on Probabilistic Combinatorics, June 17 2010, *H-Colouring Regular Bipartite Graphs*
- 22nd Cumberland Conference on Graph Theory, Combinatorics and Computing, Western Kentucky University, May 22 2009, *Counting independent sets in regular graphs*
- 47th Midwest Graph Theory Conference, Illinois Institute of Technology, November 8 2008, *Is the independent set sequence of the hypercube unimodal?*

Research presentations at Notre Dame.

- Faculty Colloquium, September 1 2022, *Eulerian numbers and TNN matrices*
- Graduate student seminar, March 31 2022, *Stirling numbers and the normal order problem*
- Graduate student seminar, October 14 2019, *Matchings in graphs*
- Graduate student seminar, October 1 2018, *Total non-negativity of generalized Stirling matrices*
- Math for Everyone, February 22 2018, *Envy-free division*
- Felix Klein seminar, September 14 2017, *Plates, olives and Morse theory*
- Discrete Mathematics seminar, September 7 2017, *Equilateral and almost equilateral sets*

- Graduate Student Seminar, March 6 2017, *Independent sets in regular graphs*
- Mathematical Research Seminar, February 19 2016, *Equilateral and almost-equilateral sets in* $\mathbb{R}^n$
- Mathematical Research Seminar, April 4 2014, *Stirling numbers of the first and second kinds*
- Discrete Mathematics seminar, September 16 2013, *A fair selection process that rarely works*
- Discrete Mathematics seminar, April 18 2013, *Stirling numbers and generalizations*
- Mathematical Research Seminar, October 5 2012, *How do I love thee? Let me count the ways*
- Discrete Mathematics seminar, September 4 2012, *Taxi walks and the hard-core distribution on* $\mathbb{Z}^2$
- Combinatorics and Logic seminar February 17 2011, *Szemerédi's regularity lemma III*
- Combinatorics and Logic seminar, February 10 2011, *Szemerédi's regularity lemma II*
- Combinatorics and Logic seminar, February 3 2011, *Szemerédi's regularity lemma I*
- Mathematical Research Seminar, October 8 2010, *Unimodality, log-concavity and the real roots property*
- Felix Klein Seminar, February 25 2010, *A topological approach to evasiveness II*
- Felix Klein Seminar, February 18 2010, *A topological approach to evasiveness I*
- Combinatorics and Logic seminar, September 15 2009, *Ultrafilters, with applications III*
- Combinatorics and Logic seminar, September 8 2009, *Ultrafilters, with applications II*
- Combinatorics and Logic seminar, September 4 2009, *Ultrafilters, with applications I*
- Mathematical Physics/Physical Mathematics Seminar, October 16 2008, *Combinatorics and Probability in Statistical Mechanics*
- Mathematical Research Seminar, September 26 2008, *Graph colouring*
- Graduate Student Seminar, September 1 2008, *The "Happy End" Problem — A Mathematical Love Story*
- Applied Mathematics Colloquium, April 28 2008, *Independent sets in graphs*

SERVICE AND OUTREACH PRESENTATIONS SINCE JULY 2007

All talks given at Notre Dame unless specified

- Multidisciplinary Academic Research Society, Penn High School, Mishawaka IN, November 25 2024, *No title*
- Science Exploration Series, November 8 2024, *Question Everything*
- Annual George Kitchen Memorial Math Lecture, Kalamazoo College, Kalamazoo MI, April 30 2024 (postponed from April 2020), *Question everything: Paradoxes, Surprises, and Counterintuitive Truths*
- "First Lecture" for Welcome Weekend, August 19 2023, *Question everything: Paradoxes, Surprises, and Counterintuitive Truths*
- "First Lecture" for Welcome Weekend, August 20 2022, *Question everything: Paradoxes, Surprises, and Counterintuitive Truths*
- "First Lecture" for Welcome Weekend, August 21 2021, *Question everything: Paradoxes, Surprises, and Counterintuitive Truths*
- Talk for admitted graduate students, March 13 2021, *Almost equilateral sets*
- Talk for admitted graduate students, March 21 2020, *Combinatorics & counting*
- Junior parents weekend presentation, February 15 2020, *Sharing secrets secretly*
- TalkScience (Scientia seminar series), February 28 2019, *Easy as 1, 2, 3 — The Art of Counting*
- Junior parents weekend presentation, February 16 2019, *Coloring maps*
- Science Exploration Series, November 10 2018, *Envy-free division*
- Junior parents weekend presentation, February 17 2018, *Coloring maps*
- Junior parents weekend presentation, February 18 2017, *The patterns of mathematics*
- Shilts/Leonard award ceremony, December 5 2016, *Reflections on teaching*
- College of Science alumni tailgate (2 talks), November 19 2016, *The patterns of mathematics*
- CAST 2016 (Science Teachers Association of Texas 2016 Conference for the Advancement of Science Teaching), San Antonio, November 10 2016, *Understanding mathematical patterns in our world*

- A Moment of Science, San Antonio, November 10 2016, *Understanding mathematical patterns in our world*
- New graduate students orientation, August 19 2016, *What is combinatorics?*
- Mathematics Teaching Seminar, February 9 2016, *Supervising Undergraduate Research*
- Notre Dame — Navy Research Forum, October 28 2011, poster presentation
- Talk for admitted graduate students, April 4 2009, *Ramsey Theory*

OTHER CONFERENCE ACTIVITY

COVID impacted events.

- Plenary speaker, 16th Annual Conference of the Academy of Discrete, Mathematics & Applications, Mangalore, India June 2020 (canceled)

Invited workshop and conference participation.

- Graph Theory: structural properties, labelings, and connections to applications, American Institute of Mathematics (AIM), July 2024
- Workshop on Analytic and Probabilistic Combinatorics, Banff International Research Station, November 2022

SELECTED PRESENTATIONS BEFORE JULY 2007

Invited conference presentations.

- 1st Canadian Discrete and Algorithmic Mathematics Conference, Banff, Minisymposium on Problems at the interface of discrete mathematics and statistical physics, May 29 2007, *Counting matchings and independent sets of a fixed size*
- ACM–SIAM Symposium on Discrete Algorithms, New Orleans, January 7 2007, *Sampling* 3*-colourings of the discrete torus*
- DIMACS–DIMATIA–Renyi Partnership Meeting, Rutgers, The State University of New Jersey, Algebraic and Geometric Methods in Combinatorics, November 8 2005, *Bounding the partition function of spin-systems*
- INFORMS Applied Probability Conference, Ottawa, Special Session on Spatial Dependence in Stochastic Networks, July 8 2005, *Long-range influence in the hard-core model*
- Canadian Mathematical Society Summer Meeting, University of Waterloo, Special Session on Random Graphs and their applications, June 4 2005, *Bounding the partition function of spin-systems*
- MSRI Program on Probability, Algorithms and Statistical Physics, Workshop on Mixing of Markov Chains in Physics and Algorithms, February 3 2005, *Slow mixing of local dynamics for* 3*-colourings on regular bipartite graphs*
- ACM–SIAM Symposium on Discrete Algorithms, New Orleans, January 12 2004, *Slow mixing of Glauber dynamics for the hard-core model on the hypercube*
- Mathematisches Forschungsinstitut Oberwolfach, Workshop in Combinatorics, January 9 2004, *Entropy and graph homomorphisms*
- Banff International Research Station Focused Research Groups, Problems in Discrete Probability, July 14 2003, *Asymptotically enumerating graph homomorphisms*
- AMS Sectional Meeting, Indiana University, Special Session on Probability, April 5 2003, *Entropy and graph homomorphisms*
- DIMACS–DIMATIA–Renyi Partnership Meeting (HOMONOLO 02), Prague, Workshop on Graph Homomorphisms, December 17 2002, *Counting weighted graph homomorphisms*
- Isaac Newton Institute programme on Computation, Combinatorics and Probability, Cambridge (UK), Workshop on Combinatorial and Computational aspects of Statistical Physics, August 28 2002, *Homomorphisms from the Hamming cube to* $\mathbb{Z}$

Colloquia.

- Department of Mathematics, Lehigh University, November 15 2006, *Spin models: Gibbs measures and mixing times*
- Department of Mathematics, George Washington University, November 14 2003, *The hard-core model: where statistical physics, communications networks and computer science meet*

Seminars.

- Discrete Mathematics Seminar, Princeton University, November 29 2006, *Global connectivity from local conditions*
- Combinatorics Seminar, University of Delaware, October 6 2006, *Counting colourings*
- Combinatorics Seminar, Georgia Institute of Technology, March 10 2006, *Bounding the partition function of spin-systems*
- Combinatorics Seminar, Graduate Center, City University of New York, March 9 2005, *Entropy and graph homomorphisms*
- Combinatorics Seminar, University of Pennsylvania, February 22 2005, *Entropy and graph homomorphisms*
- Probability Seminar, University of California, Berkeley, January 26 2005, *Homomorphisms from the Hamming cube to* $\mathbb{Z}$
- Probability Seminar, Stanford University, January 24 2005, *Entropy and graph homomorphisms*
- Probability and Algorithms Seminar, University of Pennsylvania, December 9 2004, *Slow mixing of local dynamics for uniform colourings and independent sets*
- Discrete Mathematics Seminar, Princeton University, December 1 2004, *Homomorphisms from the Hamming cube to* $\mathbb{Z}$
- Combinatorics, Optimization & Algorithms Seminar, Carnegie Mellon University, February 12 2004, *The entropy method in combinatorics*
- Probability Seminar, University of Washington, February 2 2004, *The entropy method in combinatorics*
- Nonlinear Systems Seminar, Stevens Institute of Technology, December 16 2003, *The hard-core model: where statistical physics, communications networks and computer science meet*
- Combinatorics Seminar, Georgia Institute of Technology, September 16 2003, *Slow mixing of Glauber dynamics for the hard-core model on the hypercube*
- Probability Seminar, University of Washington, April 21 2003, *Gibbs measures for independent set models*
- Combinatorics Seminar, University of Washington, January 29 2003, *Counting functions on the discrete cube*
- Combinatorics Seminar, Massachusetts Institute of Technology, February 8 2002, *Phase transition in the hard-core model on* $\mathbb{Z}^d$
- Combinatorics Seminar, Georgia Institute of Technology, January 18 2002, *Phase transition in the hard-core model on* $\mathbb{Z}^d$
- Discrete Mathematics Seminar, Institute for Advanced Study, Princeton, October 24 2001, *Phase transition in the hard-core model on* $\mathbb{Z}^d$

CONFERENCE ORGANIZATION

- AMS 2025 Spring Eastern Sectional Meeting, Special Session on Recent Trends on Graphs and Hypergraphs (with John Engbers and Cliff Smyth), University of Connecticut (Hartford), April 5–6 2025
- 8th Lake Michigan Workshop on Combinatorics and Graph Theory, University of Notre Dame, May 13–14 2023
- AMS 2022 Fall Western Sectional Meeting, Special Session on Topics in graphs, hypergraphs and set systems (with John Engbers and Cliff Smyth), University of Utah, October 22–23 2022
- AMS 2020 Fall Western Sectional Meeting, Special Session on Topics in graphs, hypergraphs and set systems (with John Engbers and Cliff Smyth), Online, October 24–25 2020

- 6th Lake Michigan Workshop on Combinatorics and Graph Theory (with Patrick Bennett and Andrzej Dudek), Western Michigan University, April 6–7 2019
- AMS 2018 Fall Central Sectional Meeting, Special Session on Probabilistic Methods in Combinatorics (with Patrick Bennett and Andrzej Dudek), University of Michigan, October 20–21 2018
- 5th Lake Michigan Workshop on Combinatorics and Graph Theory (with Patrick Bennett and Andrzej Dudek), University of Notre Dame, April 21–22 2018
- 4th Lake Michigan Workshop on Combinatorics and Graph Theory (with Patrick Bennett and Andrzej Dudek), Western Michigan University, April 15–16 2017
- AMS 2017 Spring Central Sectional Meeting, Special Session on Extremal, probabilistic and structural graph theory (with John Engbers), Indiana University, April 1–2 2017
- AMS 2016 Fall Southeastern Sectional Meeting, Special Session on Graph Theory, Hypergraphs and Set Systems (with Cliff Smyth), North Carolina State University, November 12–13 2016
- Algebra, Geometry and Combinatorics Day (ALGECOM 13) (with Alexander Diaz, Sam Evens and Misha Gekhtman), University of Notre Dame, April 30 2016
- Triangle Lectures in Combinatorics (with Cliff Smyth), University of North Carolina at Greensboro, February 27 2016
- AMS 2015 Fall Central Sectional Meeting, Special Session on Graph Theory, Hypergraphs and Set Systems (with John Engbers), Loyola University, October 2–4 2015
- 2nd Lake Michigan Workshop on Combinatorics and Graph Theory (with Andrzej Dudek), University of Notre Dame, March 7–8 2015
- AMS 2014 Fall Southeastern Sectional Meeting, Special Session on Recent Developments in Graph Theory and Hypergraph Theory (with Cliff Smyth), University of North Carolina at Greensboro, November 8–9 2014
- AMS 2010 Fall Central Sectional Meeting, Special Session on Graphs and hypergraphs (with Hemanshu Kaul), University of Notre Dame, November 5–7 2010
- 1st Canadian Discrete and Algorithmic Mathematics Conference, Minisymposium on Problems at the interface of discrete mathematics and statistical physics, Banff, May 29 2007

STUDENTS SUPERVISED

Graduate students.

- Yasmin Aguillon, June 2025 – present
- Phillip Marmorino, May 2021 – June 2025. Ph.D. dissertation: *Counting independent sets and generalized colorings in graphs with various restrictions*
- Yufei Zhang, April 2021 – May 2025. Ph.D. dissertation: *Some combinatorial problems involving total non-negativity and unimodality*
- Adrian Pacurar, May 2015 – May 2018 (Left Notre Dame due to non-academic reasons)
- Justin Hilyard, April 2010 – December 2014. Ph.D. dissertation: *Various results on enumerations of graph homomorphisms*, went to Epic Systems, Wisconsin
- John Engbers, April 2009 – May 2013. Ph.D. dissertation: *Some problems involving H-colorings of graphs*, went to tenure-track position in Department of Mathematics, Statistics and Computer Science, Marquette University

Undergraduate senior theses.

- Courtney Sharpe, August 2023 – May 2024, *The Strong Independent Set Sequence of Uniform, Linear Hyperpaths* (resulted in paper: item **50** in section Research Papers)
- Megan Laurence, August 2021 – May 2022, *Crossing numbers of graphs*
- Kyle Weingartner, May 2020 – May 2021, *Property testing*
- Camille Taltas, May 2018 – May 2019, *Markov Chains and mixing times on colorings*
- Yuyuan (Ethan) Chen, February 2015 – May 2016, *Self-avoiding walks* (resulted in paper: item **39** in section Research Papers)
- Monica Gorman, January 2015 – May 2016, *Modeling the Spread of Infection on Stochastic Networks*

- Luke Sernau, January 2013 – May 2014, *Count graph homomorphisms* (resulted in paper: L. Sernau, Graph operations and upper bounds on graph homomorphism counts, *Journal of Graph Theory* **87** (2018), 149–163)
- Sean Meehan, February 2012 – April 2013, *On the Topic of Ramsey Theory*
- Nick Seewald, February 2012 – April 2013, *Entropy and counting*
- Bethany Herwaldt, April 2009 – April 2010, *Primality testing algorithms* (published as: B. Herwaldt, Prime Numbers And Information Security, *Scientia* **1** (Spring 2010), 19–30)
- Andrew McConvey, April 2009 – April 2010, *The stable marriage problem*
- Meagan Pitluck, November 2007 – April 2009, *An Introduction to Voting Systems: Flaws, Failures, and Potential Solutions*

Other undergraduate supervision.

- Nathan Cox and Felix Ruda, January 2025 – May 2025, directed research on discrete geometry (with Nik Kuzmanovski)
- Courtney Sharpe, November 2021 – December 2022, directed research on graph theory
- Greyson Wesley and Bailee Zacovic, November 2020 – July 2021, directed research, *Enumerating graph classes* (resulted in paper: item **44** in section Research Papers)
- Henry Glunz, October 2020 – January 2021, directed reading, *The sensitivity conjecture*
- Kateri Budo, January 2020 – May 2020, directed reading, *Game theory in economics*
- Henry Glunz, October 2019 – May 2020, directed reading, *Khinchin's Three Pearls of Number Theory*
- Alexander Ju, fall 2019, directed reading, *Convex optimization*
- Michael Vanover (Purdue University), May 2019 – September 2019, Summer research, *Independent set sequence of trees*
- Katie Hyry and Kyle Weingartner, June – December 2018, Research Experience for Undergraduates and independent research, *Independent set and matching permutations* (resulted in paper: item **42** in section Research Papers)
- Jonathan Baker, Gregory Conti and Kevin Latimer, January – May 2018, directed reading, *Combinatorial optimization* (with Abdul Basit)
- Ariel Navotas, January – May 2017, directed reading, *Combinatorial optimization*
- Mary Humphrey, August 2016 – May 2017, directed reading, *Stanley-Wilf conjecture*
- James Miller, October – December 2015, Independent research, *Secret santa schemes*
- Pedro Soto (Florida International University), June – August 2015, Summer research, *Ramsey Theory*
- Hannah Porter, June – December 2014, Summer research, *Generalizing Stirling cycle numbers*
- Do Trong Thanh, June 2013 – January 2014, directed reading, *Sampling colorings*
- Do Trong Thanh, June – December 2011, Glynn Family Honors Program Summer Research, *Graph Stirling numbers* (resulted in paper: item **24** in section Research Papers)

TEACHING

University of Notre Dame. (*) indicates course chair

- Math 20860 (Honors Calculus IV), spring 2022, spring 2021
- Math 20850 (Honors Calculus III), fall 2021, fall 2020
- Math 30210 (Introduction to Operations Research), fall 2021, fall 2014, fall 2007
- Math 60610 (Discrete Mathematics, graduate class), spring 2021, spring 2017, spring 2015, spring 2009
- Math 43900 (Problem Solving in Math), fall 2020, fall 2019, fall 2015, fall 2014, fall 2013
- Math 48900 (Senior Thesis), spring 2020
- Math 10860 (Honors Calculus II), spring 2020, spring 2019, spring 2018
- Math 10850 (Honors Calculus I), fall 2019, fall 2018, fall 2017
- Math 30530 (Introduction to Probability), spring 2019, fall 2013, fall 2012, fall 2011(*), fall 2009

- Math 10120 (Finite Mathematics), spring 2018(*), spring 2017(*), spring 2016(*), spring 2014(*), spring 2013
- Math 60850 (Probability, graduate class), spring 2016
- Math 40210 (Basic Combinatorics), fall 2015, spring 2015, spring 2014, fall 2012, spring 2012
- Math 10550 (Calculus I), fall 2011
- Math 30440 (Introduction to Probability and Statistics), spring 2010(*), spring 2009(*), spring 2008
- Math 20340 (Probability and Statistics for Life Sciences), fall 2009, fall 2008
- Math 10560 (Calculus II), spring 2008

University of Pennsylvania.

- Math 581 (Probabilistic Methods in Combinatorics, graduate class), spring 2007
- Math 114 (Calculus II), spring 2007, fall 2006, fall 2005
- Math 313/CSE 313 (Computational Linear Algebra), spring 2006
- Math 430 (Introduction to Probability), fall 2005

University of Washington.

- Math 324 (Calculus III), fall 2003

Rutgers, The State University of New Jersey.

- Math 356 (Number Theory), summer 2001
- Math 134 (Calculus I), Head Teaching Assistant, fall 2000 – spring 2001
- Math 152 (Calculus II), summer 2000
- Recitation instructor (various courses), fall 1997 – spring 2000
- Math 250 (Linear Algebra), summer 1998
- Grader (300- and 400-level courses), fall 1996 – spring 1997

DEPARTMENTAL SERVICE

Committee work.

- Taliaferro Prize committee, spring 2024, fall 2017
- Department Chair, July 1 2022 — present
- Reading graduate applicant files, spring 2022, spring 2021, spring 2020 and spring 2019
- Probability search committee, fall 2021, fall 2020, fall 2016 and fall 2015
- Ad hoc committee on courtyard renovation, May 2021 – present
- Ad hoc committee on library space, May 2020 – present
- Graduate committee, May 2019 – May 2022
- Hiring committee, May 2021 – April 2022, May 2016 – April 2020, and May 2014 – April 2015
- Faculty-library liaison, August 2015 – June 2022
- Faculty classroom observation, spring 2022 (Andrei Jorza), fall 2021 (Andrei Jorza), fall 2020 (Marco Radeschi), fall 2019 (Chris Schommer-Pries), spring 2018 (Steve Heilman)
- Open search committee, September 2020 – December 2020
- Post-doctoral search committee, spring 2020 and fall 2011
- Mentor for post-doctoral researcher Abdul Basit (with Sergei Starchenko), August 2017 – June 2020
- Undergraduate committee, May 2016 – April 2019, May 2012 – April 2015 and May 2009 – April 2010
- Aumann Prize coordinator, spring 2020, spring 2019 and spring 2018
- Special Opportunities search committee, fall 2018
- Faculty teaching mentor for Claudiu Raicu, August 2014 – May 2017
- Committee on Appointments and Promotions, May 2015 – April 2017
- Departmental faculty senate representative, May 2014 – April 2017

Work with and for students.

- First year graduate student advisor for Jane Kwak (upcoming, with Natasha Dobrinen), Luis Benitez Norat (fall 2021 – spring 2022), Yufei Zhang (fall 2020 – spring 2021), Adele Zhou (fall 2016 – spring 2017), José Pastrana (fall 2015 – spring 2016), Juan Lebrón-Vázquez (fall 2014 – spring 2015), Phillip Jedlovec (fall 2013 – spring 2014), Hank Ditton (fall 2011 – spring 2012), Justin Hilyard (fall 2009 – spring 2010)
- Ph.D. defense examiner for Anthony Gomez Fonseca (April 2 2025), John Siratt (June 24 2024), Daniel Soskin (April 4 2023), Li Ling Ko (June 21 2021), Danny Orton (June 26 2019), Nyima Kao (May 3 2017), Stephen Flood (May 11 2012)
- Senior thesis reader for Yuchen Yang (May 2024), Patrick Leblanc (May 2018), Mike McCaffrey (May 2017), Eun Seuk Choi (May 2016), Katherine Ritchey (May 2013), Logan Zoellner (May 2009)
- Ph.D. oral candidacy examiner for Yasmin Aguillon (March 4 2024), Luis Benitez Norat (April 13 2023), Sorawit Eaknipitsari (April 6 2021), Anthony Fonseca Gomez (November 16 2020), Daniel Soskin (February 28 2019), Li Ling Ko (February 16 2018), Justin Miller (January 26 2018), Derric Chien (November 1 2016), Nyima Kao (April 4 2013)
- Graduate student classroom observation for Luan Doan (spring 2021), Justin Miller (spring 2019), Cunlu Zhu (spring 2017), Timothy Ferdinands (fall 2013)
- Admitted graduate students open day, March 13 2021, March 21 2020, March 24 2012, April 4 2009
- Academic Explorations Session for new first years, August 7 2020
- New math graduate student orientation, August 6 2020
- Summer reading group on Ramsey Theory, organizer, June – July 2020
- Department representative, Junior Parents Weekend, February 15 2020
- Department representative, AMS–MAA Joint Math Meetings Graduate student fair, January 17 2020 and January 12 2018
- Putnam Competition coordinator, fall 2019, fall 2015, fall 2014 and fall 2013
- Panel discussion for visiting REU students, July 8 2019, July 11 2017, July 7 2015 and June 22 2012
- Math bunker coordinator, May 2019 – present
- Undergraduate advising, April 2017 – present, April 2013 – May 2016 and April 2009 – May 2012
- Research Experience for Undergraduates organizer & mentor (with Abdul Basit), May – July 2018
- Majors night department representative, spring 2016, spring 2015 and spring 2014
- Panel member, Professional Development Seminar on postdoctoral experience, February 21 2012
- Panel member, Mathematics Teaching Seminar on job search experience, May 3 2011 and April 29 2010
- Undergraduate Admissions Admitted Student Open House, April 7 2011 and April 16 2009
- Numerous recommendation letters

Other departmental service.

- Moment to See, Courage to Act proposal (with Richard Hind and Annette Pilkington), fall 2021
- Discrete Mathematics seminar organizer, fall 2017 – spring 2018 and fall 2012 – spring 2013
- Combinatorics and Logic seminar co-organizer (with Peter Cholak), fall 2009 – spring 2012

COLLEGE AND UNIVERSITY SERVICE

Committee work.

- *ND Start*, Teaching in Science, Panel discussion on teaching in the College of Science, November 11 2022, November 11 2021
- Shilts-Leonard award selection committee, spring 2022, spring 2018 and spring 2017
- Foik award selection committee, spring 2022
- University Committee on Libraries ad hoc Committee on Open Access, fall 2021 – spring 2022
- University Librarian search committee, spring 2021
- University Committee on Libraries, May 2020 – May 2023

- Faculty Senate Bookstore Advisory Committee representative, May 2016 – April 2018
- University Committee on Admissions, Scholarships, and Financial Aid, May 2015 – April 2018
- Faculty Senate election committee, April 2017 and April 2015
- College of Science Dean search committee, fall 2014 – spring 2015
- Faculty Senate, May 2014 – April 2017
- Network physics position search committee, fall 2013
- Committee on an ethics requirement for Science majors, spring 2011

Work with and for students.

- Mentor for the Building Bridges Mentoring Program, fall 2018 – spring 2020 and fall 2014 – spring 2016
- Campus Life Council, fall 2015 – spring 2016 and fall 2014
- Graduate School recruitment day for Morehouse & Spelman undergraduates, March 13 2013
- Ph.D. defense examiner for Hyunju Kim, Department of Physics, May 19 2011, Radha Krishna Ganti, Department of Electrical Engineering, October 8 2009
- Ph.D. defense Outside Chair for Ge Liu, Department of Sociology, April 5 2011, Thomas Apker, Department of Aerospace and Mechanical Engineering, December 11 2009, ShaoPing Shen, Department of Physics, April 2 2009
- Ph.D. oral candidacy Outside Chair for Kan Wang, Department of Aerospace and Mechanical Engineering, August 17 2010
- Ph.D. oral candidacy examiner for Hyunju Kim, Department of Physics, March 17 2009
- Ph.D. written candidacy examiner for Hyunju Kim, Department of Physics, October 8 2008

SERVICE AT OTHER INSTITUTIONS

University of Pennsylvania, fall 2005 – spring 2007.

- Probability and Combinatorics Seminar Coordinator
- Preliminary Exam Committee
- Class of 1880 Prize Exam Committee
- Masters thesis examiner
- Oral qualifying examiner

Rutgers, The State University of New Jersey, fall 1999 – spring 2000.

- Graduate Student Seminar Coordinator, Department of Mathematics

SERVICE TO THE PROFESSION

Editorial service.

- Editor, Indian Journal of Discrete Mathematics, August 2018 – present
- Guest editor, special issue of *Theory of Computing* (Volume 12, 2016)

Outreach activities.

- Judge, The Siemens Competition in Math, Science & Technology, Notre Dame regional final, November 14 2017, November 15 2015, November 17 2013, November 19 2011, November 20 2010 and November 14 2009
- Judge, Northern Indiana Regional Science Fair, March 22 2014 and March 21 2009

Other service to the profession.

- Thesis defense committee (external examiner), Jinyoung Park, Rutgers, The State University of New Jersey, March 9 2020
- Thesis defense committee, Laars Helenius, Western Michigan University, March 1 2018
- Thesis proposal committee, Laars Helenius, Western Michigan University, February 11 2016
- Panel member for evaluation of federal grant proposals, fall 2015 – spring 2016 and fall 2012 – spring 2013
- External reviewer of domestic & foreign grant proposals, 2010 – present

- Program committee member, 18th International Workshop on Randomization and Computation (RANDOM'2014)
- Reviewer, Mathematical Reviews, 2006 – 2018
- Refereeing, numerous journals, 1999 – present

PROFESSIONAL MEMBERSHIPS

- American Association for the Advancement of Science (AAAS)
- American Mathematical Society (AMS)
- Association for Women in Mathematics (AWM)
- Institute for Combinatorics and its Applications (ICA)
- Mathematical Association of America (MAA)
- National Association of Mathematicians (NAM)