Vincent Vatter

CONTACT INFORMATION

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EDUCATION

Rutgers University, New Brunswick, New Jersey USA
Ph.D., Mathematics, January 2006
Advisor: Doron Zeilberger

Michigan State University, East Lansing, Michigan USA
B.S. with honors, Mathematics, August 2001

APPOINTMENTS

University of Florida, Gainesville, Florida, USA
Full Professor, 2020–present
University Term Professor, 2016–2019
Associate Professor, 2014–2020
Assistant Professor, 2010–2014

Dartmouth College, Hanover, New Hampshire, USA
John Wesley Young Research Instructor, 2008–2010

DIMACS, Piscataway, New Jersey, USA
Visiting Researcher, 2007–2008

University of St Andrews, St Andrews, Fife, Scotland
Research Fellow, 2005–2007

PUBLICATIONS

Particularly significant publications are marked with boxes.

69. **Bounds on the lettericity of graphs**, *Electronic Journal of Combinatorics*, under consideration. With Sean Mandrick.
68. **Uncountably many enumerations of well-quasi-ordered permutation classes**, *Combinatorial Theory*, under consideration. With Robert Brignall.
67. **Counting parity palindrome compositions**. *American Mathematical Monthly*, to appear.
66. **On Erdős's proof of the existence of cages**. *American Mathematical Monthly*, to appear.
65. **Three coloring via triangle counting**, *Australasian Journal of Combinatorics* **87** (2023), 352–356. With Zachary Hamaker.
64. **Penn and Teller fooled by parity argument**. *Math Horizons* **30** (2023), no. 3, 10–13.
63. **Letter graphs and geometric grid classes of permutations**, *SIAM Journal on Discrete Mathematics* **36** (2022), 2774–2797. With Bogdan Alecu, Robert Ferguson, Mamadou Moustapha Kanté, Vadim Lozin, and Viktor Zamaraev.
62. **Labelled well-quasi-order for permutation classes**. *Combinatorial Theory* **2 (3)** (2022), Article #14, 54 pp. With Robert Brignall.
61. **Letter graphs and modular decomposition**, *Discrete Applied Mathematics* **309** (2022), 215–220. With Robert Ferguson.
60. **Social distancing, primes, and Perrin numbers**, *Math Horizons* **29** (2022), no. 1, 5–7.

59. **How many pop-stacks does it take to sort a permutation?**, *The Computer Journal* **65** (2022), 2610–2614. With Michael Albert.

    - Runner up for the 2023 Wilkes Award, for the best paper published in *The Computer Journal* the previous year.

58. **Bijective proofs of proper coloring theorems**, *American Mathematical Monthly* **128** (2021), 483–499. With Bruce Sagan.

57. **Containing all permutations**, *American Mathematical Monthly* **128** (2021), 4–24. With Michael Engen.

56. **Growth rates of permutation classes: categorization up to the uncountability threshold**, *Israel Journal of Mathematics* **236** (2020), 1–43. With Jay Pantone.

55. **A probabilistic proof of a lemma that is not Burnside's**, *American Mathematical Monthly* **127** (2020), 63.

54. **An elementary proof of Bevan's theorem on the growth of grid classes of permutations**, *Proceedings of the Edinburgh Mathematical Society* **62** (2019), no. 4, 975–984. With Michael Albert.

53. **On the dimension of downsets of integer partitions and compositions**, *Australasian Journal of Combinatorics* **74**, no. 1 (2019), 98–111. With Michael Engen.

52. **Rationality for subclasses of 321-avoiding permutations**, *European Journal of Combinatorics* **78** (2019), 44–72. With Michael Albert, Robert Brignall, and Nik Ruškuc.

51. **Growth rates of permutation classes: from countable to uncountable**, *Proceedings of the London Mathematical Society* **119**, no. 4 (2019), 960–997.

50. **On the growth of merges and staircases of permutation classes**, *Rocky Mountain Journal of Mathematics* **49** (2019), 355–367. With Michael Albert and Jay Pantone.

49. **A counterexample regarding labelled well-quasi-ordering**, *Graphs and Combinatorics* **34**, no. 6 (2018), 1395–1409. With Robert Brignall and Michael Engen.

48. **Generating permutations with restricted containers**, *Journal of Combinatorial Theory Series A* **157** (2018), 205–232. With Michael Albert, Cheyne Homberger, Jay Pantone, and Nathaniel Shar.

47. **Universal layered permutations**, *Electronic Journal of Combinatorics* **25**, no. 3 (2018), Paper #P3.23, 5 pp. With Michael Albert, Michael Engen, and Jay Pantone.

46. **Linear clique-width for hereditary classes of cographs**, *Journal of Graph Theory* **84**, no. 4 (2017), 501–511. With Robert Brignall and Nicholas Korpelainen.

45. **An Erdős–Hajnal analogue for permutation classes**, *Discrete Mathematics & Theoretical Computer Science* **18**, no. 2 (2016), 5 pp.

44. **On the effective and automatic enumeration of polynomial permutation classes**, *Journal of Symbolic Computation* **76** (2016), 84–96. With Cheyne Homberger.

43. **Pattern-avoiding involutions: exact and asymptotic enumeration**, *Australasian Journal of Combinatorics* **64** (2016), 88–119. With Miklós Bóna, Cheyne Homberger, and Jay Pantone.

42. **The complexity of pattern matching for 321-avoiding and skew-merged permutations**, *Discrete Mathematics & Theoretical Computer Science* **18**, no. 2 (2016), 17 pp. With Michael Albert, Marie-Louise Lackner, and Martin Lackner.

41. **Two vignettes on full rook placements**, *Australasian Journal of Combinatorics* **64**, no. 1 (2016), 77–87. With Jonathan Bloom.

40. **A simple proof of a theorem of Schmerl and Trotter for permutations**, *Journal of Combinatorics* **6** (2015), 47–54. With Robert Brignall.

39. **Inflations of geometric grid classes of permutations**, *Israel Journal of Mathematics* **205** (2015), 73–108. With Michael Albert and Nik Ruškuc.

38. **Permutation classes**, in *Handbook of Enumerative Combinatorics*, Miklós Bóna, ed. CRC Press (2015), 754–833.

37. **Well-quasi-order for permutation graphs omitting a path and a clique**, *Electronic Journal of Combinatorics* **22**, no. 2 (2015), Paper #P2.20, 21 pp. With Aistis Atminas, Robert Brignall, Nicholas Korpelainen, and Vadim Lozin.

36. **A stack and a pop stack in series**, *Australasian Journal of Combinatorics* **58**, no. 1 (2014), 157–171. With Rebecca Smith.

35. **Inflations of geometric grid classes: three case studies**, *Australasian Journal of Combinatorics* **58**, no. 1 (2014), 27–47. With Michael Albert and Mike Atkinson.

34. **On the rearrangement conjecture for generalized factor order over $\mathbb{P}$**, *Discrete Mathematics & Theoretical Computer Science* proceedings of FPSAC 2014, (2014), 217–228. With Jay Pantone.

33. **Generating and enumerating 321-avoiding and skew-merged simple permutations**, *Electronic Journal of Combinatorics* **20**, no. 2 (2013), P44, 11 pp. With Michael Albert.

32. **Geometric grid classes of permutations**, *Transactions of the American Mathematical Society* **365** (2013), 5859–5881. With Michael Albert, Mike Atkinson, Mathilde Bouvel, and Nik Ruškuc.

31. **Large infinite antichains of permutations**, *Pure Mathematics and Applications (Pu.M.A.)* **24**, no. 2 (2013), 47-57. With Michael Albert and Robert Brignall.

30. **Counting $(\mathbf{3+1})$-avoiding permutations**, *European Journal of Combinatorics* **33** (2012), 49–61. With Mike Atkinson and Bruce Sagan.

29. **Finding regular insertion encodings for permutation classes**, *Journal of Symbolic Computation* **47** (2012), 259–265.

28. **Maximal independent sets and separating covers**, *American Mathematical Monthly* **118** (2011), 418–423.

27. **On convex permutations**, *Discrete Mathematics* **311**, no. 8–9 (2011), 715–722. With Michael Albert, Steve Linton, Nik Ruškuc, and Steve Waton.

26. **On partial well-order for monotone grid classes of permutations**, *Order* **28** (2011), 193–199. With Steve Waton.

25. **Simple extensions of combinatorial structures**, *Mathematika* **57**, no. 2 (2011), 193–214. With Robert Brignall and Nik Ruškuc.

24. **Small permutation classes**, *Proceedings of the London Mathematical Society* **103** (2011), 879–921.

23. **Subclasses of the separable permutations**, *Bulletin of the London Mathematical Society* **43** (2011), 859–870. With Michael Albert and Mike Atkinson.

22. **On points drawn from a circle**, *Electronic Journal of Combinatorics* **18**, no. 1 (2011), P223, 10 pp. With Steve Waton.

21. **Permutation classes of every growth rate above** 2.48188, *Mathematika* **56**, no. 1 (2010), 182–192.

20. **Problems and conjectures presented at the problem session**, in *Permutation Patterns*, Steve Linton, Nik Ruškuc, and Vincent Vatter, ed. Cambridge University Press (2010), 339–344.

19. **Small configurations in simple permutations**, *European Journal of Combinatorics* **31** (2010), 1781–1784.

18. **Almost avoiding permutations**, *Discrete Mathematics* **309** (2009), 6626–6631. With Robert Brignall, Shalosh B. Ekhad, and Rebecca Smith.

17. **Counting** 1324**,** 4231**-avoiding permutations**, *Electronic Journal of Combinatorics* **16**, no. 1 (2009), Research article 135, 9 pp. With Michael Albert and Mike Atkinson.

16. **The enumeration of permutations sortable by pop stacks in parallel**, *Information Processing Letters* **109** (2009), 626–629. With Rebecca Smith.

15. **A sharp bound for the reconstruction of partitions**, *Electronic Journal of Combinatorics* **15**, no. 1 (2008), Note 23, 4 pp.

14. **Decomposing simple permutations, with enumerative consequences**, *Combinatorica* **28** (2008), 385–400. With Robert Brignall and Sophie Huczynska.

13. **Enumeration schemes for restricted permutations**, *Combinatorics, Probability, and Computing* **17** (2008), 137–159.

12. **Reconstructing compositions**, *Discrete Mathematics* **308** (2008), 1524–1530.

11. **Simple permutations and algebraic generating functions**, *Journal of Combinatorial Theory Series A* **115** (2008), 423–441. With Robert Brignall and Sophie Huczynska.

10. **Simple permutations: decidability and unavoidable substructures**, *Theoretical Computer Science* **391** (2008), 150–163. With Robert Brignall and Nik Ruškuc.

9. **Finitely-labeled generating trees and restricted permutations**, *Journal of Symbolic Computation* **41** (2006), 559–572.

8. **Grid classes and the Fibonacci dichotomy for restricted permutations**, *Electronic Journal of Combinatorics* **13** (2006), Research article 54, 14pp. With Sophie Huczynska.

7. **Maximal and maximum independent sets in graphs with at most r cycles**, *Journal of Graph Theory* **53** (2006), 283–314. With Bruce E. Sagan.

6. **Maximal independent sets in graphs with at most r cycles**, *Journal of Graph Theory* **53** (2006), 270-282. With Goh Chee Ying, Koh Khee Meng, and Bruce E. Sagan.

5. **The Möbius function of a composition poset**, *Journal of Algebraic Combinatorics* **24** (2006), 117–136. With Bruce E. Sagan.

4. **Bounding quantities related to the packing density of** $1(\ell+1)\ell\dots2$, *Advances in Applied Mathematics* **33** (2004), 633–653. With Martin Hildebrand and Bruce E. Sagan.

3. **Profile classes and partial well-order for permutations**, *Electronic Journal of Combinatorics* **9**, no. 2 (2003), Research article 17, 30 pp. With Maximillian Murphy.

2. **Permutations avoiding two patterns of length three**, *Electronic Journal of Combinatorics* **9**, no. 2 (2003), Research article 6, 19 pp.

1. **Pattern frequency sequences and internal zeros**, *Advances in Applied Mathematics* **28** (2002), 395–420. With Miklós Bóna and Bruce E. Sagan.

Popular Writing

4. **Training language models with textbook-quality synthetic data**, *Towards Data Science*, June 30, 2023.
`https://towardsdatascience.com/training-language-models-with-textbook-quality-synthetic-data-783bf4a444d8`

3. **Decoding a heatmap: using espionage in the Battle for Riddler Nation**, *Better Programming*, June 25, 2023.
`https://betterprogramming.pub/decoding-a-heatmap-using-espionage-in-the-battle-for-riddler-nation-50096a4fb414`

2. **Percolating possibilities**, in *50 Visions of Mathematics*, Sam Parc, ed. Oxford University Press (2014), 134–137. With Colva Roney-Dougal.

1. **Of pancakes, mice, and men**, *Plus Magazine* (2010). With Colva Roney-Dougal.
   https://plus.maths.org/content/pancakes-mice-and-men

Popular Press

My work on superpermutations, which is discussed in the paper "Containing all permutations" (with Michael Engen) has been covered in the following articles in the popular press.

- Delahaye, J.-P., Le secret d'Arséne Lupin: les superpermutations, *Pour La Science*, 513 (Juillet 2020), 82–87.
- Honner, P., Unscrambling the hidden secrets of superpermutations, *Quanta Magazine*, January 16, 2019.
  https://www.quantamagazine.org/unscrambling-the-hidden-secrets-of-superpermutations-20190116/
- Klarreich, E., Mystery math whiz and novelist advance permutation problem, *Quanta Magazine*, November 5, 2018.
  https://www.quantamagazine.org/sci-fi-writer-greg-egan-and-\anonymous-math-whiz-advance-permutation-problem-20181105/
- Griggs, M., An anonymous 4chan post could help solve a 25-year-old math mystery, *The Verge*, October 24, 2018,
  https://www.theverge.com/2018/10/24/18019464/4chan-anon-\anime-haruhi-math-mystery.

Grants, Honors, and Awards

- *Pending*, PI, Combinatorics of permutation classes and AI-enriched proofs, Simons Foundation, $107,806 for 2024–2025 (1 year).
- *Pending*, PI, Conference on Enumerative and Algebraic Combinatorics, NSF, $22,356 for 2024 (1 year).
- *Pending*, PI, Artificial Intelligence for Humanizing and Enhancing the Learning of Proofs (AI-HELP), NSF, $749,996 for 2024–2026 (2 years).
- Runner up, 2023 Wilkes Award, for best paper published in *The Computer Journal* the previous year, for the paper "How many pop-stacks does it take to sort a permutation?"
- *Funded*, PI, Collaborative research on permutations and graphs, Simons Foundation award 636113, $42,000 for 2019–2024 (5 years).
- University of Florida Term Professorship, 2016–2019.
- *Funded*, PI, Rationality and algebraicity of permutation classes, NSA award H98230-16-1-0324, $40,000 for 2016–2018 (2 years).
- *Funded*, PI, Conference on bijective and algebraic combinatorics, NSF award DMS-1400098, $11,697 for 2014.
- *Funded*, PI, The structure of permutation classes, NSF award DMS-1301692, $159,896 for 2013–2016 (3 years).
- *Funded (not accepted)*, PI, The structure of permutation classes, NSA, $39,498 for 2013–2015 (2 years).
- *Funded*, Co-investigator, Infinite antichains of combinatorial structures, EPSRC[1] award EP/J006130/1, £91,797 (≈ $143,000 at the time) for 2012–2013 (1 year).
  PI: Robert Brignall, The Open University, Milton Keynes, England.
- *Funded*, Co-investigator, The structure of permutation classes, EPSRC award EP/J006440/1, £66,715 (≈ $104,000 at the time) for 2011–2014 (3 years).
  PI: Nik Ruškuc, University of St Andrews, St Andrews, Scotland.

[1] The Engineering and Physical Sciences Research Council (EPSRC) is roughly the British equivalent to the NSF.

- *Funded*, PI, The structure of permutation classes, NSA award H98230-12-1-0207, $40,000 for 2011–2013 (2 years).
- *Funded*, Co-PI, Conference on Permutation Patterns 2010, NSF award DMS-1003908, $14,460 for 2010.
  PI: Sergi Elizalde, Dartmouth College, Hanover, New Hampshire.
- *Funded (not accepted)*, PI, NSF Postdoctoral Research Fellowship award DMS-0703620, $108,000 for 2008–2011 (2 years).

Talks

Key: ○ = local, • = contributed, ∗ = invited, □ = keynote

∗ **Sorting with restricted containers**
Computer Science Colloquium, Indiana University (Bloomington), November 17, 2023.

• **Sorting with restricted containers**
Permutation Patterns 2023, held at the University of Burgundy (Dijon, France), July 3, 2023.

∗ **Regular languages and the enumeration of permutation classes**
International Conference on Applications of Computer Algebra (ACA 2022), held at Gebze Teknik Üniversitesi (Istanbul, Türkiye), August 15, 2022.

∗ **Growth rates of grids and merges of permutation classes**
Combinatorics and Algebras from A to Z, held virtually at Bar-Ilan University (Tel Aviv, Israel), July 26, 2021.

○ **Universal permutations**
Undergraduate Mathematics Society, University of Florida, November 28, 2018.

∗ **Less appreciated facets of permutation patterns**
Genomics, Pattern Avoidance, and Statistical Mechanics, held at Schloss Dagstuhl (Seminar 18451), Leibniz-Zentrum für Informatik, Wadern, Germany, November 6, 2018.

○ **Substructure-equivalence of combinatorial objects**
Combinatorics Seminar, University of Florida, October 23, 2018.

• **The substitution decomposition of matchings and RNA secondary structures**
Permutation Patterns 2018, held at Dartmouth College (Hanover, New Hampshire), July 13, 2018.

∗ **Sorting with restricted containers**
Experimental Mathematics Seminar, Rutgers University (New Brunswick, New Jersey), April 27, 2017.

○ **An Erdős–Hajnal-type result for permutations**
Combinatorics Seminar, University of Florida, April 11, 2017.

∗ **Growth rates of permutations classes: from countable to uncountable**
48^{th} Southeastern International Conference on Combinatorics, Graph Theory & Computing, Florida Atlantic University (Boca Raton, Florida), March 6, 2017.

∗ **Growth rates of permutation classes**
AMS Central Sectional Meeting, University of St. Thomas (Minneapolis, Minnesota), October 29, 2016.

∗ **On the growth of grid classes and staircases of permutations**
Workshop on Analytic and Probabilistic Combinatorics, Banff International Research Station (Banff, Alberta), October 25, 2016.

• **Growth rates of permutation classes: from countable to uncountable**
Permutation Patterns 2016, held at Howard University (Washington D.C.), June 29, 2016.

∗ **Generating permutations with restricted containers**
AMS Southeastern Sectional Meeting, University of Georgia, March 6, 2016.

∗ **The substitution decomposition of RNA secondary structures**
Pattern Avoidance and Genome Sorting, held at Schloss Dagstuhl (Seminar 16071), Leibniz-Zentrum für Informatik, Wadern, Germany, February 15, 2016.

• **An Erdős–Hajnal-type result for permutations**
Permutation Patterns 2015, held at De Morgan House, London, England, June 18, 2015.

∗ **Fox's growth rate theorem**
Permutation Patterns 2015, held at De Morgan House, London, England, June 17, 2015.

∗ **Sorting permutations with $\mathcal{C}$-machines**
AMS Southeastern Sectional Meeting, Georgetown University, March 8, 2015.

◦ **Maximal independent sets and separating covers**
Combinatorics Seminar, University of Florida, November 6, 2014.

∗ **Growth rates of permutation classes**
Pure Mathematics Seminar, University of Melbourne (Australia), August 1, 2014.

• **Strongly/broadly rational/algebraic permutation classes**
Permutation Patterns 2014, held at East Tennessee State University, July 7, 2014.

◦ **Rational generating functions for 321-avoiding subclasses**
Combinatorics Seminar, University of Florida, October 1, 2013.

• **A structural proof of Stanley–Wilf?**
Permutation Patterns 2013, held at Université Paris Diderot (Paris 7), Paris, France, July 2, 2013.

∗ **The Marcus-Tardos resolution of the Füredi–Hajnal and Stanley–Wilf conjectures**
Clemson REU Program, Clemson University, June 10, 2013.

◦ **Geometric grid classes of permutations**
Graduate Mathematics Association Colloquium, University of Florida, March 27, 2013.

∗ **321-avoiding permutations**
Experimental Mathematics Seminar, Rutgers University (New Brunswick, New Jersey), March 7, 2013.

∗ **Subclasses of the separable permutations**
AMS-MAA Joint Meetings, San Diego, California, January 12, 2013

□ **Small permutation classes**
Plenary talk, Permutation Patterns 2012, held at Strathclyde University, Glasgow, Scotland, June 12, 2012.

∗ **Enumeration schemes and the insertion encoding**
Experimental Mathematics Seminar, Rutgers University (New Brunswick, New Jersey), April 26, 2012.

• **Geometric grid classes of permutations**
Canadian Mathematical Society Winter Meeting, Toronto, Canada, December 11, 2011.

∗ **Geometric grid classes of permutations**
26^{th} Clemson Mini-Conference on Discrete Mathematics and Algorithms, Clemson University, October 27, 2011.

∗ **Geometric grid classes of permutations**
Pure Mathematics Colloquium, University of St Andrews, Scotland, July 21, 2011.

• **Geometric grid classes of permutations**
23^{rd} British Combinatorial Conference, held at the University of Exeter, England, July 7, 2011.

∗ **The structure of permutation classes**
Computer and Information Sciences Seminar, University of Strathclyde, Glasgow, Scotland, June 28, 2011.

∗ **Grid classes of permutations**
Experimental Mathematics Seminar, Rutgers University (New Brunswick, New Jersey), May 12, 2011.

∗ **Geometric grid classes of permutations**
AMS Spring Southeastern Section Meeting, held at Georgia Southern University, March 12, 2011.

• **Rational classes of permutations**
SIAM Conference on Discrete Mathematics, held in Austin, Texas, June 16, 2010.

• **Teaching Shalosh to sort by reversals**
From A = B to Z = 60 (Conference in Honor of Doron Zeilberger's 60th Birthday), held at Rutgers University (New Brunswick, New Jersey), May 27, 2010.

∗ **Growth rates of permutation classes**
Pure Mathematics Colloquium, University of St Andrews, Scotland, May 20, 2010.

∗ **Growth rates of permutation classes**
Joint Combinatorics Seminar, Saint Michael's College & The University of Vermont, March 24, 2010.

∗ **Genome rearrangements and simple permutations**
Mathematics Colloquium, University of Florida, February 18, 2010.

∗ **Growth rates of permutation classes**
Combinatorics Seminar, University of Florida, February 17, 2010.

∗ **Permutation classes with rational generating functions**
Experimental Mathematics Seminar, Rutgers University (New Brunswick, New Jersey), December 10, 2009.

∗ **Growth rates of permutation classes**
Experimental Mathematics Seminar, Rutgers University (New Brunswick, New Jersey), February 26, 2009.

◦ **Simple permutations and indecomposable graphs**
Combinatorics Seminar, Dartmouth College, February 5, 2009.

◦ **Growth rates of permutation classes**
Mathematics Colloquium, Dartmouth College, October 2, 2008.

∗ **On points drawn from a circle**
Summer Combo in Vermont, held at Saint Michael's College in Burlington, Vermont, July 25, 2008.

• **Small permutation classes**
Fifth International Conference on Permutation Patterns, held at the University of St Andrews in Scotland, June 12, 2007.

• **Permutation patterns as an example in the theory of relational structures**
Fourth International Conference on Permutation Patterns, held at Reykjavik University in Iceland, June 12, 2006.

∗ **Discrete Morse theory and Möbius functions**
Topology Seminar, University of Texas – Austin, January 23, 2006.

∗ **The amazing Loehr-Warrington ten to the power n conjecture**
AMS-MAA Joint Meetings, San Antonio, Texas, January 13, 2006.

◦ **Defense of automatic (symbolic!) enumeration**
Experimental Mathematics Seminar, Rutgers University (New Brunswick, New Jersey), November 17, 2005.

◦ **Maximal independent sets in graphs**
Graduate Student Seminar, Rutgers University (New Brunswick, New Jersey), November 16, 2005.

∗ **Simple permutations**
Combinatorics and Probability Seminar, University of Pennsylvania, November 14, 2005.

◦ **Packing densities of permutations**
REU Seminar, Rutgers University (New Brunswick, New Jersey), July 12, 2005.

∗ **Enumeration schemes for restricted permutations**
First International Workshop on Permutation Patterns, held at the University of Haifa, in Haifa, Israel, June 1, 2005.

∗ **Enumeration schemes for restricted permutations**
CIRCA (Centre for Interdisciplinary Research in Computational Algebra) Seminar, University of St Andrews, Scotland, May 9, 2005.

• **Enumerative and structural applications of profile classes**
Third International Conference on Permutation Patterns, held at the University of Florida in Gainesville, Florida, March 9, 2005.

◦ **The structure of permutation ideals**
Graduate Student Combinatorics Seminar, Rutgers University (New Brunswick, New Jersey), February 14, 2005.

◦ **Packing densities of permutations**
Graduate Student Combinatorics Seminar, Rutgers University (New Brunswick, New Jersey), November 17, 2004.

◦ **Counting restricted permutations by computer**
Experimental Mathematics Seminar, Rutgers University (New Brunswick, New Jersey), September 23, 2004.

• **To what extent can restricted permutation counting be automated?**
Second International Conference on Permutation Patterns, held at Malaspina University-College in Nanaimo, British Columbia, Canada, July 5, 2004.

◦ **Maximal independent sets in graphs with at most r cycles**
Graduate Student Combinatorics Seminar, Rutgers University (New Brunswick, New Jersey), April 19, 2004.

• **Well-quasi-ordering and permutations**
Conference on Extremal Combinatorics honoring 200 years of Peter Frankl, Zoltán Füredi, Ervin Gyõri and János Pach, held at the Rényi Institute in Budapest, Hungary, April 7, 2004.

◦ **Partial well-order and permutations**
Graduate Student Combinatorics Seminar, Rutgers University (New Brunswick, New Jersey), November 10, 2003.

◦ **Automatic generation of finitely-labeled generating trees for restricted permutations**
Experimental Mathematics Seminar, Rutgers University (New Brunswick, New Jersey), October 30, 2003.

◦ **Restricted permutations**
Introduction to Mathematics at Rutgers, August 31, 2003.

• **Taming sets of permutations**
First International Conference on Permutation Patterns, held at the University of Otago in Dunedin, New Zealand, February 10, 2003.

∗ **Partially well-ordered sets of permutations**
Combinatorics and Graph Theory Seminar, Michigan State University, January 6, 2003.

- **Internal zeros in frequency sequences**
  Combinatorics and Graph Theory Seminar, Michigan State University, April 10, 2000.

Mentoring

- Advisor to Ph.D. students
  - Advisor to Michael Engen, Ph.D., University of Florida, 2021. Developer, Paypal (2021–present).
  - Advisor to Robert Ferguson, Ph.D., University of Florida, 2021.
  - Advisor to Jay Pantone, Ph.D., University of Florida, 2015. John Wesley Young Research Instructor, Dartmouth College (2015–2018); Assistant Professor, Marquette University (2018–present).
  - Advisor to Aziza Jefferson, Ph.D., University of Florida, 2015. Operations Researcher, Department of Defense (2015–present).
  - Co-advisor to Robert Brignall, Ph.D., University of St Andrews, 2007. Research Fellow, University of Bristol (2007–2010); Lecturer[2], Open University (2010–2015); Senior Lecturer[2], Open University (2015–present).
- External examiner for Ph.D. students
  - Lapo Cioni, Ph.D., Università degli Studi di Firenze (University of Florence), 2023.
  - Yonah Biers-Ariel, Ph.D., Rutgers University (New Brunswick), 2020.
  - Marie-Louise Lackner (née Bruner), Ph.D., Technische Universität Wien (Vienna University of Technology), 2015.
  - Megan Martinez, Ph.D., Dartmouth College, 2015.
  - Jonathan Bloom, Ph.D., Dartmouth College, 2014.
- Committee member (non-chair) for Ph.D. students
  - Ruyue (Julia) Yuan, Ph.D. University of Florida, 2020.
  - Keith Copenhaver, Ph.D., University of Florida, 2019.
  - Anthony Van Duzer, Ph.D., University of Florida, 2019.
  - Daniel Gray, Ph.D., University of Florida, 2015.
  - Cheyne Homberger, Ph.D., University of Florida, 2014.
- Initial graduate mentor to Shi Zhou (2022–present), Adam Gregory (2019–2021), Andrew Kriehn (2016–2018), Jesse Adamski (2015–2017), Ruyue (Julia) Yuan (2015–2017), Leo Betthauser (2014–2016), Charles Walker (2014–2016), Anthony Van Duzer (2013–2015), Victoria Crawford (2012–2014), Jordan Draper (2012–2014), Junie Joseph (2012–2014), Daniel Rose (2012–2014), Lei Pan (2011–2013).
- University of Florida University Scholars Program mentor for Tim Dwyer (2011-2012) and James Fairbanks (2011–2012).
- Senior honors thesis advisor for Daniel Rose (2011–2012).

[2]The British ranks of Lecturer and Senior Lecturer are roughly equivalent to the American ranks of Assistant and Associate Professor, respectively.

Professional Service

- Conference organization:
  - Chair of the Organizing Committee for *Enumerative and Algebraic Combinatorics: In Honor of Bruce Sagan's 70th Birthday*, to be held February 25–27, 2024 at the University of Florida.
  - Co-chair for the *Enumerative Combinatorics* special session, AMS Fall Southeastern Sectional Meeting, held October 15 & 16, 2022 at the University of Tennessee at Chattanooga.
  - Co-chair for the *Patterns in Permutations* special session, AMS Fall Southeastern Sectional Meeting, held November 2 & 3, 2019 at the University of Florida.
  - Member of the Organizing Committee for *Permutation Patterns 2018*, held July 9–13, 2018 at Dartmouth College (New Hampshire).
  - Co-chair for the *Enumerative Combinatorics* special session, AMS-MAA Joint Meetings, held January 10–13, 2015 in San Antonio, Texas.
  - Chair of the Organizing Committee for *Bijective and Algebraic Combinatorics: In Honor of Bruce Sagan's 60th Birthday*, held March 24 & 25, 2014 at the University of Florida.
  - Member of the Program Committee for *Formal Power Series and Algebraic Combinatorics (FPSAC) 2011*, held June 13–17, 2011 in Reykjavík, Iceland.
  - Co-chair of the Organizing Committee for *Permutation Patterns 2010*, held August 9–13, 2010 at Dartmouth College (New Hampshire).
  - Member of the Organizing Committee for *From $A = B$ to $Z = 60$*, a conference in honor of Doron Zeilberger's 60th birthday, held May 27 & 28, 2010 at Rutgers University (New Jersey).
  - Member of the Organizing Committee for *Permutation Patterns 2007*, held June 11–15, 2007 at the University of St Andrews (Scotland).
- Member of the editorial board of the journal *Enumerative Combinatorics and Applications*, 2021–present.
- Journal refereeing: *Advances in Applied Mathematics*, *Advances in Mathematics*, *Algebraic Combinatorics*, the *American Mathematical Monthly*, *Annals of Combinatorics*, *Applicable Analysis and Discrete Mathematics*, *Ars Combinatoria*, the *Australasian Journal of Combinatorics*, *Combinatorial Theory*, *Combinatorica*, *Combinatorics Probability and Computing*, *The Computer Journal*, *Discrete Applied Mathematics*, *Discrete Mathematics*, *Discrete Mathematics Algorithms and Applications*, *Discrete Mathematics & Theoretical Computer Science*, *Discussiones Mathematicae Graph Theory*, the *Electronic Journal of Combinatorics*, the *European Journal of Combinatorics*, *FILOMAT*, *Graphs and Combinatorics*, *Information Processing Letters*, *Involve*, the *Journal of Algebraic Combinatorics*, the *Journal of Combinatorial Theory Series A*, the *Journal of Combinatorics*, the *Journal of Graph Theory*, the *Journal of Integer Sequences*, the *Journal of Physics A: Mathematical and Theoretical*, the *Journal of Statistical Planning and Inference*, the *Journal of Symbolic Computation*, *Mathematics of Computation*, *Mathematics Magazine*, *Notices of the American Mathematical Society*, *Order*, *Proceedings of the American Mathematical Society*, *Proceedings of the Royal Society of Edinburgh Section A: Mathematics*, the *Punjab University Journal of Mathematics*, *Pure Mathematics and Applications*, *Selecta Mathematica*, *Séminaire Lotharingien de Combinatoire*, the *Taiwanese Journal of Mathematics*, and *Transactions of the American Mathematical Society*.
- Conference refereeing: ESA (European Symposia on Algorithms), FPSAC (Formal Power Series and Algebraic Combinatorics), ICPMS (International Conference on Physics, Mathematics and Statistics), ISAAC (International Symposium on Algorithms and Computation), IWOCA (International Workshop on Combinatorial Algorithms), LATA (Language and Automata Theory and Applications), SODA (ACM-SIAM Symposium on Discrete Algorithms), and WADS (Algorithms and Data Structures Symposium).
- Grant reviewing:

  - EPSRC (United Kingdom) College of Peer Reviewers: full college member 2013–present.
    * Grant reviewer for the EPSRC New Horizons grant scheme, 2020.
  - Grant reviewer for the Czech Science Foundation, 2020.
  - Grant reviewer for the Icelandic Research Fund, 2014, 2019, and 2021.
  - Grant reviewer for the Initiatives Science Innovation Territoire Economie en Bourgogne-Franche-Comté program (France), 2018.
  - Panel member for the AMS / National Security Agency grants, 2015.
  - Panel member for the National Science Foundation, 2014.

- Miscellaneous reviewing:
  - Reviewer for *Mathematical Reviews* (*MathSciNet*), 2004–present.
  - Reviewer for *zbMath*, 2020–present.
  - Referee for textbooks published by Birkhauser, Springer, and Wiley, 2015–present.
  - Book reviewer for the *LMS Newsletter*, No. 416, July 2012, pp. 24–25.

- Editor of conference proceedings & special issues:
  - Editor (with Miklós Bóna, Mathilde Bouvel, and Lara Pudwell) of *Discrete Mathematics & Theoretical Computer Science*, vol. **22**, no. 2 (2020), connected to the conference *Permutation Patterns 2019* (in progress).
  - Editor (with Miklós Bóna, Mathilde Bouvel, and Lara Pudwell) of *Discrete Mathematics & Theoretical Computer Science*, vol. **21**, no. 1 (2019), connected to the conference *Permutation Patterns 2018*.
  - Editor (with Robert Brignall and Sergi Elizalde) of *Pure Mathematics and Applications*, vol. **22**, no. 2 (2011), connected to the conference *Permutation Patterns 2010*.
  - Editor (with Steve Linton and Nik Ruškuc) of the book *Permutation Patterns* (2010), vol. **376** of the London Mathematical Society Lecture Note Series, Cambridge University Press, Cambridge, England, connected to the conference *Permutation Patterns 2007*.

Departmental Service

- Steering Committee: speaker 2020–2021, 2023–2024; elected member 2015–2017, 2019–2021, 2022–present.
- Graduate Selection Committee: chair 2015–2017, 2019–2020; member 2011–2015, 2018–2019, 2020–present.
- Department Chair Search Committee: elected member 2017–2018.
- Undergraduate Committee Upper Division: chair 2022–present; member 2021–2022.
- Faculty Hiring Committee: chair 2021–2022 and 2022–2023; member 2018–2019.
- Postdoc Search Committee: chair 2019–2020.
- Lecturer Search Committee: member 2021.
- Tenure and Promotion Committee: member 2021–2022.
- Graduate Committee: member 2013–2017.
- Combinatorics Exam Committee: chair 2018–2020; member 2010–2017, 2018–present.
- Robert Long Prize Committee: member 2012–2014.
- Colloquium, Conferences, Visitors, and Travel Committee: member 2010–2015.
- Hiring Plan Committee: member 2016–2017.
- Combinatorics Seminar: organizer 2010–2014, 2015–2016, 2019–2020.