

## ALEXANDER BURSTEIN

### Publications and Talks

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### POSITION

Associate Professor, Department of Mathematics, Howard University, Washington, DC

### RESEARCH INTERESTS

Combinatorics and graph theory; especially, enumerative and algebraic combinatorics; in particular, topics related to permutation statistics, patterns in permutations, and the Riordan group.

### PUBLICATIONS

1. Miklós Bóna, Alexander Burstein, Permutations with exactly one copy of a monotone pattern of length  $k$ , and a generalization, *Annals of Combinatorics* (2022), <https://doi.org/10.1007/s00026-021-00549-0>.
2. Alexander Burstein, Louis W. Shapiro, Pseudo-involutions in the Riordan group, *Journal of Integer Sequences* **25** (2022), Article 22.3.6.
3. Alexander Burstein, Opel Jones, Enumeration of Dumont permutations avoiding certain four-letter patterns, *Discrete Mathematics and Theoretical Computer Science*, **22:2** (2021), #7.
4. Jean-Luc Baril, Alexander Burstein, Sergey Kirgizov, Pattern statistics in faro words and permutations, *Discrete Mathematics* **344** (2021), no. 8, 112464.
5. Jonathan Bloom, Alexander Burstein, Egge triples and unbalanced Wilf-equivalence, *Australasian Journal of Combinatorics*, **64(1)** (2016), 232-251.
6. Alexander Burstein, On the distribution of some Euler-Mahonian statistics, *Journal of Combinatorics*, **6** (2015), no. 3, 273-284.
7. Alexander Burstein, Jay Pantone, Two examples of unbalanced Wilf-equivalence, *Journal of Combinatorics*, **6** (2015), no. 1-2, 55-67.
8. Alexander Burstein, Sergi Elizalde, Total occurrence statistics on restricted sets, *Pure Mathematics and Applications (Pu.M.A.)* **24** (2013), no. 1, 103-123.
9. Ziyad AlSharawi, Alexander Burstein, Michael Deadman, Abdullahi Umar, A recursive sequence arising from a combinatorial problem in botanical epidemiology, *Journal of Difference Equations and Applications* **19** (2013), no. 6, 981-993.
10. Alexander Burstein, A short proof for the number of permutations containing pattern 321 exactly once, *Electronic Journal of Combinatorics* **18(2)** (2011), P21.

11. Alexander Burstein, Vít Jelínek, Eva Jelínková, Einar Steingrímsson, The Möbius function of separable and decomposable permutations, *Journal of Combinatorial Theory, Series A* **118** (2011), 2346–2364.
12. Alexander Burstein, Matthieu Josuat-Vergés, Walter Stromquist, New Dumont permutations, *Pure Mathematics and Applications (P.U.M.A.)* **21** (2010), no. 2, 177–206.
13. Alexander Burstein, On joint distribution of adjacencies, descents and some Mahonian statistics, in *Proceedings of the 22nd International Conference on Formal Power Series and Algebraic Combinatorics (FPSAC 2010)*, August 2010, San Francisco, CA, *DMTCS Proceedings*, vol. **AN**, 601–612.
14. Alexander Burstein, Peter Hästö, Packing sets of patterns, *European Journal of Combinatorics* **31** (2010), no. 1, 241–253.
15. Alexander Burstein, Niklas Eriksen, Combinatorial properties of permutation tableaux, in *Permutation Patterns* (2010), S.A. Linton, N. Ruškuc, V. Vatter (eds.), LMS Lecture Note Series No. 376, Cambridge University Press, pp. 171–192.  
Extended abstract (12 pages) in *Proceedings of the 20th Annual International Conference on Formal Power Series and Algebraic Combinatorics (FPSAC 2008)*, June 2008, Viña del Mar, Chile.
16. Alexander Burstein, Isaiah Lankham, Restricted patience sorting and barred pattern avoidance, in *Permutation Patterns* (2010), S.A. Linton, N. Ruškuc, V. Vatter (eds.), LMS Lecture Note Series No. 376, Cambridge University Press, pp. 233–257.  
Extended abstract (12 pages) in *Proceedings of the 18th International Conference on Formal Power Series and Algebraic Combinatorics (FPSAC 2006)*, June 2006, San Diego, CA.
17. Alexander Burstein, Sergey Kitaev, Partially ordered patterns and their combinatorial interpretations, *Pure Mathematics and Applications (P.U.M.A.)* **19** (2008), no. 2-3, 27–38.
18. Alexander Burstein, Sergey Kitaev, Toufik Mansour, Independent sets in certain classes of (almost) regular graphs, *Pure Mathematics and Applications (P.U.M.A.)*, **19** (2008), no. 2-3, 17–26.
19. Alexander Burstein, On some properties of permutation tableaux, *Annals of Combinatorics* **11** (2007), 355–368.
20. Alexander Burstein, Walter Stromquist, Dumont permutations of the third kind, extended abstract, *Proceedings of the 19th International Conference on Formal Power Series and Algebraic Combinatorics (FPSAC 2007)*, July 2007, Tianjin, China.
21. Alexander Burstein, Sergi Elizalde, Toufik Mansour, Restricted Dumont permutations, Dyck paths and noncrossing partitions, *Discrete Mathematics* **306** (2006), no. 22, 2851–2869.  
Extended abstract in *Proceedings of the 18th International Conference on Formal*

- Power Series and Algebraic Combinatorics* (FPSAC 2006), June 2006, San Diego, CA.
22. Alexander Burstein, Isaiah Lankham, Combinatorics of patience sorting piles, *Séminaire Lotharingien de Combinatoire*, **54A** (2006), Article B54Ab, 19 pp.  
Extended abstract in *Proceedings of the 18th International Conference on Formal Power Series and Algebraic Combinatorics* (FPSAC 2006), June 2006, San Diego, CA.
  23. Alexander Burstein, Isaiah Lankham, A geometric form for the extended patience sorting algorithm, *Advances in Applied Mathematics* **36** (2006), no. 2, 106–117.  
Extended abstract in *Proceedings of the 17th International Conference on Formal Power Series and Algebraic Combinatorics* (FPSAC 2005), June 2005, Taormina, Italy.
  24. Alexander Burstein, Restricted Dumont permutations, *Annals of Combinatorics* **9** (2005), 269–280.
  25. Alexander Burstein, Sergey Kitaev, On unavoidable sets of word patterns, *SIAM Journal on Discrete Mathematics* **19** (2005), no. 2, 371–381.
  26. Alexander Burstein, Peter Hästö, Toufik Mansour, Packing patterns into words, *Electronic Journal of Combinatorics* **9(2)** (2002–2003), #R20.
  27. Alexander Burstein, Toufik Mansour, Words restricted by 3-letter generalized multi-permutation patterns, *Annals of Combinatorics* **7** (2003), no. 1, 1–14.
  28. Alexander Burstein, Toufik Mansour, Counting occurrences of subword patterns, *Discrete Mathematics and Theoretical Computer Science* **6:1** (2003), 1–12.
  29. Alexander Burstein, Toufik Mansour, Words restricted by patterns with at most 2 distinct letters, *Electronic Journal of Combinatorics* **9(2)** (2002–2003), #R3.
  30. Alexander Burstein, Sylvie Corteel, Alexander Postnikov, Carla D. Savage, A lattice path approach to counting partitions with minimum rank  $t$ , *Discrete Mathematics* **249** (2002), no. 1–3, 31–39.
  31. Alexander Burstein, Herbert S. Wilf, On cyclic strings without long constant blocks, *Fibonacci Quarterly* **35** (1997), no. 3, 240–247.
  32. *Ph.D. Thesis*: Enumeration of words with forbidden patterns, University of Pennsylvania, 1998. *Adviser*: Herbert S. Wilf.

## **CONFERENCE TALKS**

1. Miklos Bóna, Alexander Burstein, Permutations with exactly one copy of a monotone pattern of length  $k$ , and a generalization, June 15-16, 2021, University of Strathclyde, Glasgow, Scotland, online at <http://combinatorics.cis.strath.ac.uk/pp2021/>.

2. Alexander Burstein, Pattern classes equinumerous to the class of ternary forests, 2020 Permutation Patterns Virtual Workshop, June 30 – July 1, 2020, online at <https://permutationpatterns.com/2020-virtual-workshop/>.
3. Alexander Burstein, Pattern classes enumerated by OEIS A098746, Special Session on Patterns in Permutations, AMS Southeastern Section Meeting, November 2-3, 2019, Gainesville, FL.
4. Alexander Burstein, Walter Stromquist, Unimodal inversion sequences and related pattern classes, talk,
  - (a) Minisymposium on Permutations in Patterns and Words, 26th British Combinatorial Conference (BCC'17), July 3-7, 2017, University of Strathclyde, Glasgow, UK. (all minisymposium talks are invited)
  - (b) 15th International Conference on Permutation Patterns (PP'17), June 26-30, 2017, Reykjavik University, Reykjavik, Iceland.
5. Alexander Burstein, Opel Jones, Restricted Dumont permutations, Special Session on Enumerative Combinatorics, AMS Central Section Meeting, October 28-30, 2016, University of St. Thomas, Minneapolis, MN.
6. Alexander Burstein, Walter Stromquist, Unimodal inversion sequences and pattern-avoiding classes, poster, 14th International Conference on Permutation Patterns (PP'16), June 27 - July 1, 2016, Howard University, Washington, DC.
7. Alexander Burstein, Walter Stromquist, Unimodal inversion sequences and pattern-avoiding classes, Special Session on Enumerative Combinatorics and Graph Theoretic Applications, AMS Central Section Meeting, October 3-4, 2015, Chicago, IL.
8. Alexander Burstein, Unbalanced Wilf-equivalence, Special Session on Patterns in Permutation and Words, and Applications, AMS Central Section Meeting, September 20-21, 2014, Eau Claire, WI.
9. Alexander Burstein, Unbalanced Wilf-equivalence, 12th International Conference on Permutation Patterns (PP'14), July 7-11, 2014, East Tennessee State University, Johnson City, TN.
10. Alexander Burstein, Unbalanced Wilf-equivalences, Bijective and Algebraic Combinatorics: In honor of Bruce Sagan's 60th birthday, March 24-25, 2014, University of Florida, Gainesville, FL.
11. Alexander Burstein, Equidistribution of some Euler-Mahonian statistics, AMS Special Session on Patterns in Permutations and Words, AMS-MAA Joint Mathematics Meetings, January 9-12, 2013, San Diego, CA.
12. Alexander Burstein, A combinatorial proof of equidistribution of some Euler-Mahonian statistics, Special Session on Algorithms, Permutation Patterns and Enumerative Combinatorics, AMS Eastern Section Meeting, September 22-23, 2012, Rochester, NY.

13. Alexander Burstein, A combinatorial proof of joint equidistribution of some pairs of permutation statistics, 10th International Conference on Permutation Patterns (PP'12), June 11-15, 2012, Glasgow, UK.
14. Alexander Burstein, Dumont permutations containing one occurrence of certain three and four letter patterns, Special Session on Enumerative and Geometric Combinatorics, AMS Central Section Meeting, March 31 – April 1, 2012, Lawrence, KS.
15. Alexander Burstein, Chinenye Ofodile, Dumont permutations containing one occurrence of certain three- and four-letter patterns, 9th International Conference on Permutation Patterns (PP'11), June 20-24, 2011, San Luis Obispo, CA.
16. Alexander Burstein, On joint distribution of adjacencies, descents and some Mahonian statistics, 22th International Conference on Formal Power Series and Algebraic Combinatorics (FPSAC'10), August 2-6, 2010, San Francisco, CA.
17. Alexander Burstein, On joint distribution of adjacencies, descents and some Mahonian statistics, From  $A = B$  to  $Z = 60$ : Conference in Honor of Doron Zeilberger's 60th Birthday, May 27-28, 2010, Rutgers University, Piscataway, NJ.
18. Alexander Burstein, Matthieu Josuat-Vergés, Walter Stromquist, Distribution of some combinatorial statistics on old and new Dumont permutations, Workshop on Combinatorics, Enumeration, and Invariant Theory (WCEIT), George Mason University, March 19-20, 2010.
19. Alexander Burstein, On joint distribution of adjacencies, descents and some Mahonian statistics, Special Session, AMS Southeastern Section Meeting, October 30 – November 1, 2009, Boca Raton, FL.
20. Alexander Burstein, Distribution of pattern statistics on Dumont permutations, 7th International Conference on Permutation Patterns (PP'09), July 13-17, 2009, Florence, Italy.
21. Alexander Burstein, Peter Hästö, Packing sets of patterns, Special Session, AMS Western Section Meeting, October 4-5, 2008, Vancouver, Canada.
22. Alexander Burstein, Niklas Eriksen, Combinatorial properties of permutation tableaux, Special Session, AMS Southeastern Section Meeting, Murfreesboro, TN, November 2007; 20th International Conference on Formal Power Series and Algebraic Combinatorics (FPSAC'08), Viña del Mar, Chile, June 2008. (revised and expanded)
23. Alexander Burstein, Sergi Elizalde, Total occurrence statistics on restricted sets, 6th International Conference on Permutation Patterns (PP'08), June 2008, University of Otago, Dunedin, NZ.
24. Alexander Burstein, Walter Stromquist, New Dumont permutations, Special Session, AMS Central Section Meeting, Chicago, IL, October 2007.

25. Alexander Burstein, Walter Stromquist, Dumont permutations of the third kind, 19th International Conference on Formal Power Series and Algebraic Combinatorics (FPSAC'07), Tianjin, China, July 2007. (poster presentation)
26. Alexander Burstein, Niklas Eriksen, Some more properties of permutation tableaux, 5th International Conference on Permutation Patterns (PP'07), St. Andrews, UK, June 2007.
27. Alexander Burstein, Properties of permutation tableaux, 58<sup>ème</sup> Séminaire Lotharingien de Combinatoire (SLC-58), Lyon, France, March 2007.
28. Alexander Burstein, Sergi Elizalde, Toufik Mansour, Restricted Dumont permutations, Dyck paths and noncrossing partitions, 18th International Conference on Formal Power Series and Algebraic Combinatorics (FPSAC'06), San Diego, CA, July 2006. (poster presentation)
29. Alexander Burstein, Isaiah Lankham, Patience sorting and barred pattern avoidance, 18th International Conference on Formal Power Series and Algebraic Combinatorics (FPSAC'06), San Diego, CA, July 2006. (poster presentation)
30. Alexander Burstein, On some properties of permutation tableaux, 4th International Conference on Permutation Patterns (PP'06), Reykjavik University, Iceland, June 2006.
31. Alexander Burstein, Isaiah Lankham, Patience sorting on words and lexicographic arrays, 2006 AMS Joint Meetings, San Antonio, TX.
32. Alexander Burstein, Isaiah Lankham, Combinatorics of patience sorting piles, 17th International Conference on Formal Power Series and Algebraic Combinatorics (FPSAC'05), Taormina, Italy, June 2005. (poster presentation)
33. Non-intersecting patience sorting shadow diagrams and barred permutation patterns, Workshop on Permutation Patterns, University of Haifa, May 2005.
34. A geometric form for the extended patience sorting algorithm, 3rd International Conference on Permutation Patterns (PP'05), University of Florida, Gainesville, FL, March 2005.
35. Alexander Burstein, Sergey Kitaev, Partially ordered generalized patterns and their combinatorial interpretations, 3rd International Conference on Permutation Patterns (PP'05), University of Florida, Gainesville, FL, March 2005.
36. Alexander Burstein, Toufik Mansour, Restricted Dumont permutations, 2nd International Conference on Permutation Patterns (PP'04), Malaspina University-College, Nanaimo, BC, Canada, July 2004.
37. Alexander Burstein, Toufik Mansour, Packing patterns into words, 1st International Conference on Permutation Patterns (PP'03), University of Otago, Dunedin, New Zealand, February 2003.

38. Alexander Burstein, Toufik Mansour, Words restricted by patterns with at most 2 distinct letters, 14th International Conference on Formal Power Series and Algebraic Combinatorics (FPSAC'02), University of Melbourne, Melbourne, Australia, July 2002. (poster presentation)
39. Alexander Burstein, Distinguished patterns in words and permutations, 1999 AMS-MAA Joint Meetings, Baltimore, MD.
40. Alexander Burstein, Enumeration of words with forbidden patterns, 1998 AMS-MAA Joint Meetings, San Antonio, TX.