JAMES G. PROPP

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EMPLOYMENT

- University of Massachusetts Lowell, Professor, 2006–present
- Tufts University, Visiting Professor of Mathematics and Computer Science, 2014–2015
- Microsoft New England Research Lab, Visiting Researcher, 2014–2015
- Mathematical Sciences Research Institute:
  - Einsenbud Visiting Scholar, Spring 2012
  - Research Professor, Fall 1996
  - Visiting Postdoctoral Fellow, Fall 1992
- University of California Berkeley:
  - Chancellor's Visiting Professor, Spring 2012
  - Adjunct Assistant Professor, 1988–1990
- Microsoft Research Laboratories, Consulting Researcher, Summer 2011
- University of Wisconsin–Madison:
  - Associate Professor, 1999–2006
  - Assistant Professor, 1998–1999
- Brandeis University, Visiting Associate Professor, 2002–2003
- Harvard University, Visiting Associate Professor, 2001–2002
- Olin College, Visiting Associate Professor, Fall 2000
- Massachusetts Institute of Technology:
  - Visiting Scholar, 1998–1999 and Fall 2000
  - Associate Professor, 1996–1998
  - Assistant Professor, 1990–1996
- AT&T Bell Laboratories, Consultant, Summers 1991 and 1992
- University of Maryland, Visiting Professor, 1987–1988

EDUCATION

- Ph.D., Mathematics, 1987, University of California at Berkeley (research in ergodic theory supervised by Jacob Feldman; thesis entitled *Coding from the Past*)
- Certificate of Advanced Study, 1983, Cambridge University (Part III Maths Tripos)
- A.B., Mathematics, 1982, Harvard College (Magna cum laude, Phi Beta Kappa)

SCHOLARSHIPS, AWARDS, AND GRANTS

- Simons Collaboration Grant, 2019–2024
- Mathematical Association of America Trevor Evans Award, 2018
- American Mathematical Society Honorary Fellowship, Class of 2016
- National Science Foundation Grant for Research in Mathematics, 1992–1995, 1995–1998, 1999–2002, 2006–2009, and 2010–2016
- NSF Supplementary Grant for Research Experiences for Undergraduates, 1995–1996 and 1997–1998
- National Security Agency Grant for Research in Mathematics, 1992–1995, 1995–1998, 1999–2001, and 2004–2006

- UMass Lowell Department of Mathematical Sciences Teaching Excellence Award, 2007–2008
- INFORMS College on Simulation's Outstanding Simulation Publication Award, 2000 (joint with David Wilson)
- MIT Class of 1922 Career Development Professorship, 1995–1998
- Phi Beta Kappa of Northern California Award for Excellence in Teaching, 1990
- NSF Postdoctoral Research Fellowship in Mathematics, 1987–1990

PUBLICATIONS (available through my homepage and the arXiv)

- Lattice structure for orientations of graphs, *Electronic Journal of Combinatorics* 32(4) P4.26 (2025)
- Is 1 prime, and does it matter?, *Math Horizons* (November 2025)
- Counting triangles in triangles (with Adam Propp-Gubin), *The Pi Mu Epsilon Journal* 16(1) (2025), 33–40
- Tilings of benzels via generalized compression (with Colin Defant, Leigh Foster, Rupert Li, and Benjamin Young), *SIAM Journal on Discrete Mathematics* 39(1) (2025), 146–162
- Trimer covers in the triangular grid: twenty mostly open problems, *Proceedings of the 2022 Conference on Open Problems in Algebraic Combinatorics* (2024)
- Homomesy via toggleability statistics (with Colin Defant, Sam Hopkins, and Svetlana Poznanovic), *Combinatorial Theory* 3(2) (2023), #14
- Tilings of benzels via the abacus bijection (with Colin Defant, Rupert Li, and Benjamin Young), *Combinatorial Theory* 3(2) (2023), #16
- Three Tricks or One Method?, *Math Horizons* 31(1) (2023), 8–11
- A pentagonal number theorem for tribone tilings (with Jesse Kim), *Electronic Journal of Combinatorics* 30(3) (2023), #P3.26
- Some 2-adic conjectures concerning polyomino tilings of Aztec diamonds, *Integers* 23 (2023), #A30
- A greedy chip-firing game (with Rupert Li), *Random Structures and Algorithms* (2022)
- The muffin curse, *Math Horizons* 29(3) (2022), 16–19
- Conway's Tiling Groups (with R. Kenyon and J. Lagarias), *Notices of the AMS* 69(7) (2022), 1148–1151
- The Genius Box, *Journal of Humanistic Mathematics* 11(2) (2021), 451–464
- Combinatorial, piecewise-linear, and birational homomesy for products of two chains (with D. Einstein), *Algebraic Combinatorics* 4(2) (2021), 201–224
- Conway's influence on the study of random tilings, *Mathematical Intelligencer* 43(2) (2021), 40–46
- Germ order for one-dimensional packings (with Aaron Abrams, Henry Landau, Zeph Landau, Jamie Pommersheim, and Alexander Russell), *Online Journal of Analytic Combinatorics*, Issue 16 (2021), 1–18
- Brussels sprouts, noncrossing trees, and parking functions (with Caleb Ji), *Enumerative Combinatorics and Applications* 1(1) (2021), #S2R1
- The square root of pi, *Math Horizons* 28(3) (2021), 14–17
- The combinatorics of frieze patterns and Markoff numbers, *Integers* 20 (2020), #A12
- Quantifying noninvertibility in discrete dynamical systems, *Electronic Journal of Combinatorics* 27(3) (2020), #P3.51
- Who mourns the tenth Heegner number?, *Math Horizons* 27(2) (2019), 18–21; republished in Princeton University Press, Best Writing on Mathematics 2020
- Prof. Engel's marvelously improbable machines, *Math Horizons* 26(2) (2018), 5–9; republished in Princeton University Press, Best Writing on Mathematics 2019

- Sorting via chip-firing (with S. Hopkins and T. McConville), *Electronic Journal of Combinatorics* 24(3) (2017), #P3.13
- The paintball party, *Math Horizons* 25(2) (2017), 18–21
- Formation of an interface by competitive erosion (with S. Ganguly, L. Levine, and Y. Peres), *Probability Theory and Related Fields* 168 (2017), 455–509
- Noncrossing Partitions, Toggles, and Homomesies (with D. Einstein, M. Farber, E. Gunawan, M. Joseph, M. Macauley, and S. Rubinstein-Salzedo), *Electronic Journal of Combinatorics* 23(3) (2016), #P3.52
- What I learned from Richard Stanley, in the Stanley Festschrift (AMS, 2016)
- Homomesy in products of two chains (with T. Roby), *Electronic Journal of Combinatorics* 22(3) (2015), #P3.4
- Enumeration of Tilings (book chapter); in *The Handbook of Enumerative Combinatorics* (CRC Press, 2015), 541–588
- Real analysis in reverse, *American Mathematical Monthly* 120 (2013), 392–408
- Equivalence classes of permutations under various relations generated by constrained transpositions (with S. Linton, T. Roby, and J. West), *Journal of Integer Sequences* 15 (2012), #12.9.1
- Local-to-global principles for the hitting sequence of a rotor walk (with G.P. Giacaglia, L. Levine, and L. Zayas-Palmer), *Electronic Journal of Combinatorics* 19(1) (2012), #P5
- A Galois connection in the social network, *Mathematics Magazine* 85(1) (2012), 34–36
- Tiling lattices with sublattices, I (with D. Feldman and S. Robins), *Discrete and Computational Geometry* 46 (2011), 184–186
- What is ... a sandpile? (with L. Levine), *Notices of the AMS* 57(8) (2010), 976–979
- Rotor walks and Markov chains (with A. Holroyd), in *Algorithmic Probability and Combinatorics*, AMS (2010), 105–126
- Discrete analog computing with rotor-routers, *Chaos* 20(3) (2010)
- A counterexample to integration by parts (with A. Kheifets), *Mathematics Magazine* 83(3) (2010), 222–225
- Perfect matchings for the three-term Gale-Robinson sequences (with M. Bousquet-Melou and J. West), *Electronic Journal of Combinatorics* 16(1) (2009), R125
- Coupling from the past (with D. Wilson), in *Markov Chains and Mixing Times* (Levin, Peres, Wilmer), AMS (2008)
- Chip-firing and rotor-routing on directed graphs (with A.E. Holroyd, L. Levine, K. Meszaros, Y. Peres, and D.B. Wilson), in *In and out of Equilibrium II*, Progress in Probability 60 (2008), 331–364
- Topological entropy for nonuniformly continuous maps (with B. Hasselblatt and Z. Nitecki), *Discrete and Continuous Dynamical Systems* 22 (2008), 201–213
- Degree-growth of monomial maps (with B. Hasselblatt), *Ergodic Theory and Dynamical Systems* 27 (2007), 1375–1397
- Combinatorial interpretations for rank-two cluster algebras of affine type (with G. Musiker), *Electronic Journal of Combinatorics* 14 (2007), R15
- In search of Robbins stability (with K. Kedlaya), *Advances in Applied Mathematics* 34 (2005), 659–668
- Lambda-determinants and domino-tilings, *Advances in Applied Mathematics* 34 (2005), 871–879
- Generalized domino-shuffling, *Theoretical Computer Science* 303 (2003), 267–301
- Exponentiation and Euler measure, *Algebra Universalis* 49 (2003), 459–471
- Generating a random sink-free orientation in quadratic time (with H. Cohn and R. Peman-

tle), *Electronic Journal of Combinatorics* 9(1) (2002), R10

- The many faces of alternating-sign matrices, in *Discrete Mathematics and Theoretical Computer Science Proceedings AA (DM-CCG)*, 43–58 (2001)
- A reciprocity theorem for domino tilings, *Electronic Journal of Combinatorics* 8(1) (2001), R18
- A variational principle for domino tilings (with H. Cohn and R. Kenyon), *Journal of the AMS* 14 (2001), 297–346
- Trees and matchings (with R. Kenyon and D. Wilson), *Electronic Journal of Combinatorics* 7(1) (2000), R25
- Three-player impartial games, *Theoretical Computer Science* 233 (2000), 263–278
- How the alternating-sign matrix conjecture was solved (with D. Bressoud), *Notices of the AMS* 46 (1999), 637–646
- Combinatorial games under auction play (with A. Lazarus, D. Loeb, W. Stromquist, D. Ullman), *Games and Economic Behavior* 27 (1999), 229–264
- Domino tiling with barriers (with R. Stanley), *Journal of Combinatorial Theory, Series A* 87 (1999), 347–356
- Enumeration of matchings: problems and progress, in *New perspectives in geometric combinatorics*, MSRI Series 38, CUP, 1999
- *Microsurveys in Discrete Probability* (book), edited with D. Aldous, DIMACS Series 41, AMS, 1998
- How to get a perfectly random sample from a generic Markov chain and generate a random spanning tree of a directed graph (with D. Wilson), *Journal of Algorithms* 27 (1998), 170–217
- Coupling from the past: a user's guide (with D. Wilson), in *Microsurveys in Discrete Probability* (1998), 181–192
- The shape of a typical boxed plane partition (with H. Cohn and M. Larsen), *New York Journal of Mathematics* 4 (1998), 137–165
- A pedestrian approach to a method of Conway, or, a tale of two cities, *Mathematics Magazine* 70 (1997), 327–340
- Boundary-dependent local behavior for 2-D dimer models, *International Journal of Modern Physics B* 11 (1997), 183–187
- Generating random elements of finite distributive lattices, *Electronic Journal of Combinatorics* 4(2) (1997), R15
- Richman games (with A. Lazarus, D. Loeb, and D. Ullman), in *Games of No Chance*, MSRI Publications 29, CUP, 1996
- Exact sampling with coupled Markov chains and applications to statistical mechanics (with D. Wilson), *Random Structures and Algorithms* 9 (1996), 223–252
- Local statistics for random domino tilings of the Aztec diamond (with H. Cohn and N. Elkies), *Duke Mathematical Journal* 85 (1996), 117–166
- The fundamental group of a Z^2 shift (with W. Geller), *Ergodic Theory and Dynamical Systems* 15 (1995), 1091–1118
- The fractional chromatic number of Mycielski's graphs (with M. Larsen and D. Ullman), *Journal of Graph Theory* 19 (1995), 411–416
- A new take-away game, in *The Lighter Side of Mathematics*, MAA, 1994
- Producing new bijections from old (with D. Feldman), Advances in Mathematics 113, 1–44 (1995)
- Further travels with my ant (with D. Gale, S. Sutherland, and S. Troubetkzoy), Mathematical Entertainments column, Mathematical Intelligencer 17, #3, 48–56 (1995)
- Further ant-ics, Mathematical Intelligencer 16, #1, 37–42 (1994)

- A linear Ramsey theorem (with D. Feldman), Advances in Mathematics 95, 1–7 (1992)
- Alternating sign matrices and domino tilings (with N. Elkies, G. Kuperberg, and M. Larsen), Journal of Algebraic Combinatorics 1, 111–132, 219–234 (1992)
- On the cookie game (with D. Ullman), International Journal of Game Theory 20, 313–324 (1992)
- On tensor powers of integer programs (with R. Pemantle and D. Ullman), SIAM Journal of Discrete Mathematics 5, 127–143 (1992)
- Coding Markov chains from the past, Israel Journal of Mathematics 75, 289–328 (1991)
- A Shannon-McMillan theorem for motley names, Israel Journal of Mathematics 69, 225–234 (1990)
- What are the laws of greed?, American Mathematical Monthly 96, 334–336 (1989)
- Some variants of Ferrers diagrams, Journal of Combinatorial Theory Ser. A 52, 98–128 (1989)
- Kepler's spheres and Rubik's cube, Mathematics Magazine 61, 231–239 (1988)
- Greedily partitioning the natural numbers into sets free of arithmetic progressions (with J. Gerver and J. Simpson), Proceedings of the American Mathematical Society 102, 765–772 (1988)
- Nim for three: an overview and an offer of alcohol, Eureka No. 43, Easter 1983, 41–46