

Dan Romik

Publication list

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Downloadable versions of my publications can be found at my publications page <https://www.math.ucdavis.edu/~romik/publications/>.

Book

- The Surprising Mathematics of Longest Increasing Subsequences. Cambridge University Press, 2015.

Available for download at <https://www.math.ucdavis.edu/~romik/book/>.

Journal publications

1. The Taylor coefficients of the Jacobi theta constant θ_3 . To appear in *Ramanujan J.*
2. Improved upper bounds in the moving sofa problem (joint with Yoav Kallus). To appear in *Adv. Math.*
3. Differential equations and exact solutions in the moving sofa problem. *Experimental Math.* 27 (2018), 316–330.
4. On the number of n -dimensional representations of $SU(3)$, the Bernoulli numbers, and the Witten zeta function. *Acta Arithmetica* 180 (2017), 111–159.
5. Bijective combinatorial proof of the commutation of transfer matrices in the dense $O(1)$ loop model (joint with Ron Peled). *Séminaire Lotharingien de Combinatoire* 73 (2015), B73b.
6. Limit shapes of bumping routes in the Robinson-Schensted correspondence (joint with Piotr Śniady). *Random Struct. Alg.* 48 (2016), 171–182.
7. Connectivity patterns in loop percolation I: the rationality phenomenon and constant term identities. *Commun. Math. Phys.* 330 (2014), 499–538.
8. Jeu de taquin dynamics on infinite Young tableaux and second class particles (joint with Piotr Śniady). *Ann. Probab.* 43 (2015), 682–737.
9. New enumeration formulas for alternating sign matrices and square ice partition functions (joint with Arvind Ayyer). *Adv. Math.* 235 (2013), 161–186.

10. Arctic circles, domino tilings and square Young tableaux. *Ann. Probab.* 40 (2012), 611–647.
11. Phase transitions in gravitational allocation (joint with Sourav Chatterjee, Ron Peled and Yuval Peres). *Geom. Funct. Anal.* 20 (2010), 870–917.
12. A formula for a doubly refined enumeration of alternating sign matrices (joint with Matan Karklinsky). *Adv. Appl. Math.* 45 (2010), 28–35.
13. More refined enumerations of alternating-sign matrices (joint with Ilse Fischer). *Adv. Math.* 222 (2009), 2004–2035.
14. The oriented swap process (joint with Omer Angel and Alexander E. Holroyd). *Ann. Probab.* 37 (2009), 1970–1998.
15. Enumeration formulas for Young tableaux in a diagonal strip (joint with Yuliy Baryshnikov). *Israel J. Math.* 178 (2010), 157–186.
16. Gravitational allocation to Poisson points (joint with Sourav Chatterjee, Ron Peled and Yuval Peres). *Annals of Math.* 172 (2010), 617–671.
17. Random sorting networks (joint with Omer Angel, Alexander E. Holroyd and Bálint Virág). *Adv. Math.* 215 (2007), 839–868.
18. The dynamics of Pythagorean triples. *Trans. Amer. Math. Soc.* 360 (2008), 6045–6064.
19. Integrals, probability and MacMahon’s theorem (joint with George Andrews, Henrik Eriksson and Fedor Petrov). *J. Comb. Theory Ser. A.* 114 (2007), 545–554.
20. Universal finitary codes with exponential tails (joint with Nate Harvey, Alexander Holroyd and Yuval Peres). *Proc. London Math. Soc.* 94 (2007), 475–496.
21. Shortest paths in the Tower of Hanoi graph and finite automata. *SIAM J. Disc. Math.* 20 (2006), 610–622.
22. The number of guillotine partitions in d dimensions (joint with Eyal Ackerman, Gill Barequet and Ron Pinter). *Inform. Proc. Lett.* 98 (2006), 162–167.
23. Random walks with k -wise independent increments (joint with Itai Benjamini and Gady Kozma). *Elec. Comm. Prob.* 11 (2006), 100–107.
24. Limit shapes for random square Young tableaux (joint with Boris Pittel). *Adv. Appl. Math.* 38 (2007), 164–209.
25. Permutations with short monotone subsequences. *Adv. Appl. Math.* 37 (2006), 501–510. An extended abstract appeared in *Proc. of EuroComb 2005*.
26. Waiting for a bat to fly by (in polynomial time) (joint with Itai Benjamini, Gady Kozma, László Lovász and Gábor Tardos). *Combinatorics, Probability and Computing.* 15 (2006), 673–683.

27. Roots of the derivative of a polynomial. *Amer. Math. Monthly* 112 (2005), 66–68.
28. Some formulas for the central trinomial and Motzkin numbers. *J. of Integer Sequences* 6 (2003), article 03.2.3.
29. The number of steps in the Robinson-Schensted algorithm. *Funct. Anal. Appl.* 39 (2005), 152–155.
30. On distributions computable by random walks on graphs (joint with Guy Kindler). *SIAM J. Disc. Math.* 17 (2004), 624–633. Also appeared in Proc. of the Fifteenth ACM-SIAM Symposium on Discrete Algorithms (SODA04), 124–131.
31. Integrals, partitions, and cellular automata (joint with Alexander E. Holroyd and Thomas Liggett). *Trans. Amer. Math. Soc.* 356 (2004), 3349–3368.
32. Partitions of n into $t\sqrt{n}$ parts. *Europ. J. of Combinatorics* 26 (2005), 1–17.
33. Explicit formulas for hook walks on continual Young diagrams. *Adv. Appl. Math.* 32 (2004), 625–654.
34. Projecting the surface measure of the sphere of ℓ_p^n (joint with Assaf Naor). *Ann. Inst. Henri Poincaré Prob. Stat.* 39 (2003), 241–261.
35. Some Comments on Euler’s Series for $\frac{\pi^2}{6}$, *The Math. Gazette*, July 2002, 281–284.
36. Stirling’s Approximation for $n!$: the Ultimate Short Proof? *Amer. Math. Monthly* 107 (2000), 556–557.
37. Sharp entropy bounds for discrete statistical simulation. *Statist. Probab. Lett.* 42 (1999), 219–227.

Publications in conference proceedings

- Local extrema in random permutations and the structure of longest alternating subsequences. *Disc. Math. Theor. Comp. Sci.* Proceedings vol. AO (2011), 825–834. (Proceedings of the 23rd International Conference on Formal Power Series and Algebraic Combinatorics — FPSAC 2011).

Patents

- Method and apparatus for filtering data packets. U.S. Patent 8,355,324. Y. Baryshnikov, E. H. Grosse, D. Romik, F. X. Zane.

Software

I have developed and self-published the following mathematical software applications and packages, which are available to download from my software web page (<https://www.math.ucdavis.edu/~romik/software/>):

- Mac-based mathematical simulation apps:
 - `ASM Simulator`, 2009.
 - `Allocation`, 2008.
 - `MacTableaux`, 2008.
 - `MacSort`, 2008
- Research software packages:
 - `SofaBounds`, Unix software application, 2017. Developed jointly with Yoav Kallus.
 - `MovingSofas`, `Mathematica` package, 2016.
 - `SU3-ASYM`, `Mathematica` package, 2015.
 - The combinatorics of fully packed loops and Razumov-Stroganov conjectures, `Mathematica` package and slide presentation, 2014.
 - `RefinedASM1234`, `Maple` package, 2012. Developed jointly with Arvind Ayer.
 - `GammaDelta`, `Mathematica` package, 2012. Developed jointly with Arvind Ayer.
 - `RefinedASM`, `Mathematica` package, 2009. Developed jointly with Ilse Fischer.