

BENEDEK VALKÓ

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RESEARCH INTERESTS *Probability, random matrices, large stochastic systems.*

POSITIONS HELD 2016–present *Full Professor*, University of Wisconsin Madison
2013–2016 *Associate Professor*, University of Wisconsin Madison
2008–2013 *Assistant Professor*, University of Wisconsin Madison
2005–2008 *Postdoctoral Fellow*, University of Toronto at Scarborough
2004 *Research Assistant*, Technical University Budapest
2003–2005 *Junior Researcher*, Rényi Institute of Mathematics,
Hungarian Academy of Sciences

EDUCATION 2004 Ph.D. in Mathematics
Technical University Budapest, Hungary
2000 M. Sc. in Mathematics
Eötvös Loránd University of Budapest, Hungary

PH.D. THESIS *Hydrodynamic Behavior of Hyperbolic Two-Component Systems*
(Technical University Budapest, 2004)
Thesis advisor: Prof. Bálint Tóth

AWARDS 2011–2016 *NSF CAREER award DMS-1053280* (\$499 999)
Random eigenvalue problems and fluctuations of large stochastic systems.
2009–2012 *NSF Research Grant DMS-0905820* (\$150 000)
Random matrices and interacting particle systems
2004 *Géza Grünwald Prize* awarded by the János Bolyai
Mathematical Society of Hungary
2001 *Pro Scientia Prize* awarded by the Council of National Scientific
Students' Associations, Hungary
2000 *Kató Rényi Prize* awarded by the János Bolyai
Mathematical Society of Hungary
1997, 1999 *First Prize, National Scientific Student Conference*, Hungary

1. B. Valkó, B. Virág: The Sin_β operator. <https://arxiv.org/abs/1604.04381>
2. D. Holcomb, B. Valkó: Overcrowding asymptotics for the Sin_β process, Accepted for publication in *Annales de l'Institut Henri Poincaré (B) Probabilités et Statistiques*
3. B. Rider, B. Valkó: Matrix Dufresne identities. Accepted for publication in *International Mathematics Research Notices*. <http://arxiv.org/abs/1409.1954>
4. D. Holcomb, B. Valkó: Large deviations for the Sin_β and Sch_τ processes. *Prob. Theory and Rel. Fields*, Vol. 163, Issue 1, 339–378, (2015).
5. G. Moreno Flores, T. Seppäläinen, B. Valkó: Fluctuation exponents for directed polymers in the intermediate scaling regime. *Electronic Journal of Probability*, Vol. 19 (2014) paper 89, 1-28.
6. B. Valkó, B. Virág: Random Schrödinger operators on long boxes, noise explosion and the GOE, *Transactions of AMS*, Volume 36, 3709–3728, 6 (2014)
7. J. Quastel, B. Valkó: Diffusivity of lattice gases. *Archive for Rational Mechanics and Analysis*, Volume 210, Issue 1, pp 269-320 (2013)
8. E. Kritchevski, B. Valkó, B. Virág: The scaling limit of the critical one-dimensional random Schrödinger operator, *Comm. Math. Phys.*, **314**, Issue 3, 775-806. (2012)
9. B. Tóth, B. Valkó: Superdiffusive bounds on self-repellent Brownian polymers and diffusion in the curl of the Gaussian free field in $d = 2$, *Journal of Stat. Phys.*, **147**, Issue 1, 113–131 (2012)
10. P. Tarrès, B. Tóth, B. Valkó: Diffusivity bounds for 1d Brownian polymers, *Annals of Probab.*, **40**, no. 2, 695-713. (2012)
11. T. Oh, J. Quastel and B. Valkó: Interpolation of Gibbs measures with White Noise for Hamiltonian PDE, *Jour. Math. Pure Appl.*, **97**, Issue 4, 391–410 (2012)
12. S. Jacquot, B. Valkó: Bulk scaling limit of the beta Laguerre ensemble, *Electronic Journal of Probability*, Vol. 16 (2011) paper 11, 314-346.
13. G. Amir, O. Angel, B. Valkó: The TASEP speed process, *Annals of Probab.*, **39**, no. 4, 1205-1242, (2011).
14. B. Valkó, B. Virág: Large gaps between random eigenvalues, *Annals of Probab.*, **38**, no. 3, 1263–1279 (2010)
15. T. Seppäläinen, B. Valkó: Bounds for scaling exponents for a 1+1 dimensional directed polymer in a Brownian environment, *Alea* 7, 451-476 (2010)
16. B. Valkó, B. Virág: Continuum limits of random matrices and the Brownian carousel, *Inventiones Mathematicae* **177**, no. 3, (2009)
17. J. Quastel, B. Valkó: KdV Preserves White Noise, *Commun. Math. Phys.* **277** (2008), no. 2, 707-714.

18. J. Quastel, B. Valkó: A note on the diffusivity of finite-range asymmetric exclusion processes on \mathbf{Z} , In: V. Sidoravicius, M.E. Vares (eds): *In and Out of Equilibrium 2, Progress in Probability* **60**, Birkhäuser (2008), 543–550
19. A. Rudas, B. Tóth, B. Valkó: Random Trees and General Branching Processes, *Random Structures and Algorithms* **31** (2007), no. 2, 186–202
20. J. Quastel, B. Valkó: $t^{1/3}$ Superdiffusivity of Finite-Range Asymmetric Exclusion Processes on \mathbf{Z} , *Commun. Math. Phys.* **273** (2007), no. 2, 379–394.
21. B. Valkó: Hydrodynamic limit for perturbation of a hyperbolic equilibrium point in two-component systems, *Ann. Inst. H. Poincaré Probab. Statist.* **42** (2006), no. 1, 61–80.
22. B. Tóth, B. Valkó: Perturbation of singular equilibria of hyperbolic two-component systems: a universal hydrodynamic limit, *Commun. Math. Phys.* **256**, 111-157 (2005)
23. B. Tóth, B. Valkó: Onsager Relations and Eulerian Hydrodynamic Limit for Systems with Several Conservation Laws, *Journal of Stat. Phys.*, **112** (2003), 497-521
24. B. Tóth, B. Valkó: Between equilibrium fluctuations and Eulerian scaling: Perturbation of equilibrium for a class of deposition models, *Journal of Stat. Phys.*, **109** (2002), 177-205
25. B. Valkó: Discrepancy of arithmetic progressions in higher dimensions, *Journal of Number Theory*, **92** (2002), 117–130.
26. S. Csörgő, B. Valkó, W.B. Wu: Random multisets and bootstrap means. *Acta Sci. Math. (Szeged)*, **67** (2001), 843–875.
27. B. Valkó: On irregularities of sums of integers, *Acta Arithmetica*, **92** (2000), 367–381.
28. G. Dombi, B. Valkó: On a problem of Erdős, *Acta Mathematica Hungarica*, **77** (1997), 47–56.

CONFERENCES
ORGANIZED

- 2005 *Large Scale Behaviour of Interacting Particle Systems: Fluctuations and Hydrodynamics*
Budapest, Hungary (co-organizer)
- 2015 *Stochastics and Interactions*
Budapest, Hungary (co-organizer)
- 2016 *Beta Ensembles: Universality, Integrability, and Asymptotics*
Banff, Canada (co-organizer)

MENTORING

- Graduate students*
 Diane Holcomb - Ph. D. 2014
 Christopher Janjigian - expected Ph. D. 2016
 Hans Chaumont - expected Ph. D. 2018

Postdoctoral fellows advised

Gregorio Moreno Flores 2010–2013 (co-advised with T. Seppäläinen)

SELECTED
INVITED
LECTURES

- 2009 *International Congress on Mathematical Physics*, Prague
- 2009 Harvard University Random Matrix Seminar
- 2009 *Brownian motion and random matrices*
American Institute of Mathematics, Palo Alto
- 2010 *Seminar on Stochastic Processes*, Orlando
- 2010 *28th European Meeting of Statisticians*, Piraeus
- 2010 *Midwest Probability Colloquium*, Evanston
- 2010 *Southern California Analysis & PDE meeting*, UCLA,
- 2010 *Random Matrix Theory and its Applications II*
Mathematical Sciences Research Institute, Berkeley
- 2011 *35th Conference on Stochastic Processes and their Applications*, Oaxaca
- 2011 Duke University, Probability Seminar
- 2012 Cambridge, MIT Probability Seminar
- 2012 *8th World Congress in Probability and Statistics*, Istanbul
- 2012 *Workshop on Interacting particle systems, growth models and random matrices*
Warwick
- 2012 Toronto Probability Seminar
- 2013 Harvard University Random Matrix Seminar
- 2014 *Stochastic Analysis: Around the KPZ Universality Class*, Oberwolfach
- 2014 *Beta-ensembles, carousels and stochastic operators* (lecture series)
Gaukushuin University, Tokyo
- 2015 Temple University, Probability Seminar
- 2015 *Random Matrices, Random Growth Processes and Statistical Physics*
Simons Center For Geometry and Physics
- 2015 Princeton University, Probability Seminar
- 2016 *British Mathematics Colloquium*, Bristol

SERVICE AND
OUTREACH

Co-organizer of the *Toronto Probability Seminar*, (2006–2008).
Organizer of the *UW – Madison Probability Seminar* (2009–2012),
co-organizer (2012–).
Co-organizer of the *Wisconsin Mathematics, Engineering and Science Tal-
ent Search* (2011–2012), director of the program (2012–)
Associate editor for the *Annals of Applied Probability* (2013–)
Refereed papers for various journals including *Electronic Journal of Prob-
ability*, *Probability Theory and Related Fields*, *Electronic Communica-
tions in Probability*, *Annals of Probability*.
Director of Undergraduate Studies at the Department of Mathematics of
UW-Wisconsin (2014–)