

CURRICULUM VITAE

Péter Csikvári

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Personal data

- Place and date of birth: Budapest (Hungary), 8th March 1984
- Nationality: Hungarian
- E-mail: peter.csikvari@gmail.com
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Education

- 2007-2011: Eötvös Loránd University, PhD student in Mathematics (supervisor: Tamás Szőnyi)
Thesis: Graph polynomials and graph transformations in algebraic graph theory (2011)
- 2002-2007: Eötvös Loránd University, student in Mathematics (supervisor: András Sárközy)
MSc thesis: Subset sum problems (2007)
- 1996-2002: Fazekas Mihály High School, class specialised in Mathematics

Employment

- 2020-present: Alfréd Rényi Institute of Mathematics
- 2016-2020: MTA-ELTE Geometric and Algebraic Combinatorics Research Group
- 2016-2017: Alfréd Rényi Institute of Mathematics
- 2010-present: Eötvös Loránd University, assistant professor, later associate professor
- 2013-2016: Massachusetts Institute of Technology, applied mathematics instructor
- 2010-2013: Alfréd Rényi Institute of Mathematics, young researcher

Research visits

- Georgia Institute of Technology, Atlanta, invited by Prasad Tetali (2015, 1 week)
- Centrum Wiskunde and Informatica, Amsterdam, invited by Alexander Schrijver (2012, 1 week)
- University of Memphis, invited by Béla Bollobás (2008, 4 months)

Competitions and Awards

- Erdős Pál prize, 2021 (an award by the Hungarian Academy of Sciences)
- Junior prize, 2018 (an award by the Hungarian Academy of Sciences)
- Junior Prima prize, 2015 (an award by the Hungarian Academy of Sciences)
- Géza Grünwald prize, 2012 (an award for young researchers by the Bolyai Mathematical Society)
- Prize of the László Patai Foundation, 2009 (an award for young researchers by the Bolyai Mathematical Society)
- Outstanding student of the Faculty of Natural Sciences, 2006 (an award by Eötvös Loránd University)

- 1st prize at 12th International Mathematics Competition, Bulgaria, 2005
- 1st prize at 10th International Mathematics Competition, Romania, 2003
- 2nd prize at 43rd International Mathematical Olympiad, United Kingdom, 2002
- 3rd prize at 42nd International Mathematical Olympiad, USA, 2001

Grants

- Lendület grant: Counting in Sparse Graphs Lendület Research Group, 2020-2025
- Maria Skłodowska-Curie Individual Fellowship, 2017-2019
- NSF grant DMS-1500219, "Extremal graph theory, graph limits, and algebraic invariants", 2015-2016 (From 2016 to 2018 the grant is transferred to Alex Postnikov.)

Professional Activities

- Editor of *Studia Scientiarum Mathematicarum Hungarica: Combinatorics, Geometry and Topology* since 2020 september
- Editor of *Acta Mathematica Hungarica* since 2019 september
- Editor of *Transactions on Combinatorics* since 2016
- Editor of *International Journal of Mathematics and Statistics* since 2015
- Managing editor of the journal *Combinatorica, An International Journal on Combinatorics and the Theory of Computing*, from 2013 January 1 to 2013 August 31.
- Local organizer of the Erdős Centennial Conference (2013 July 1-5, approximately 700 participants)
- Member of the János Bolyai Mathematical Society since 2005
- Member of the Editorial Board of *KöMaL (Mathematical and Physical Journal for Secondary Schools, published by the János Bolyai Mathematical Society and the Loránd Eötvös Physical Society)* between 2002 and 2005
- Interfaces of the Theory of Combinatorial Limits Workshop, main organizer with Dan Král', 2022
- Drafting Workshop in Discrete Mathematics and Probability, 2022, one of the 10 main organizers
- Drafting Workshop in Discrete Mathematics and Probability, 2023, one of the 15 main organizers

Teaching

- Problem Solving Seminar in Combinatorics, Eötvös Loránd University (4 semesters, 2018-20)
- Selected Topics in Graph Theory, Eötvös Loránd University (2 semesters, 2019-21)
- Discrete Mathematics II for Msc students: Probabilistic methods, Eötvös Loránd University (5 semesters, 2018-22)
- Algebraic and Probabilistic Methods in Combinatorics for graduate students, Eötvös Loránd University (1 semester in 2017)
- Discrete Mathematics for Msc students, Eötvös Loránd University (7 semesters lecture and 1 semester recitation, 2016-2022)
- Exercise class in Algebra and Number Theory, Eötvös Loránd University (1 semester, 2016)

- Algebraic Combinatorics, Massachusetts Institute of Technology (2 semesters, 2015-2016)
- Combinatorial Analysis, Massachusetts Institute of Technology (1 semester, 2015)
- Undergraduate Discrete Mathematics Seminar, Massachusetts Institute of Technology (2 semesters, 2014)
- Exercise class in Calculus, Massachusetts Institute of Technology (2013)
- Exercise class in Discrete Mathematics I and II for undergraduate students, Eötvös Loránd University (13 semesters, 2006-2012; 2016)
- Exercise class in Discrete Mathematics for graduate students, Eötvös Loránd University (4 semesters, 2009-2012)
- Exercise class in Algebra for undergraduate students, Eötvös Loránd University (1 semester, 2009)
- Exercise class in Linear Algebra for undergraduate students, Eötvös Loránd University (1 semester, 2007)

Supervision

- Márton Borbényi, PhD, Eötvös Loránd University, 2022–present
- Márton Borbényi, Msc thesis, Eötvös Loránd University 2022
- Joanna Jasińska, PhD, Eötvös Loránd University, 2021–present
- Pál Bärnkop, PhD, Eötvös Loránd University, 2020–present
- Csongor Beke, Gergely Kál Csáji, Sára Pituk, REU, Eötvös Loránd University 2021
- Tamás Szőke, Msc thesis, Eötvös Loránd University 2020
- Márton Borbényi, Bsc thesis, Eötvös Loránd University 2020
- Roland Somogyi, Msc thesis, Eötvös Loránd University 2020
- Márton Borbényi, András Imolay, Ádám Schweitzer, Haoran Luo, Undergraduate Research Opportunity Program, Eötvös Loránd University 2019–2020
- Zsófia Toma, Bsc thesis, Eötvös Loránd University 2017
- Ferenc Bencs, PhD, Central European University, 2016-2020
- Ryan Alweiss, Yang Liu, Tahsin Saffat, Vuong, Undergraduate Research Opportunity Program, Massachusetts Institute of Technology, 2015-2016
- Theo McKenzie, Bsc senior thesis (shadow advisor: Sukhada Fadnavis), Harvard University 2015
- Ferenc Bencs, research, Eötvös Loránd University 2013–2014
- Gábor Szűcs, Msc thesis, Eötvös Loránd University 2013
- Ákos Kovács, Bsc thesis, Eötvös Loránd University 2013
- Bálint Varga, Bsc thesis, Eötvös Loránd University 2012

Publications

- P. Csikvári: *Subset sums avoiding quadratic nonresidues*, Acta Arithmetica **135** (2008), pp. 91–98
- P. Csikvári: *A note on character sums*, Acta Math. Hungar. **123** (2009), pp. 357–363

- P. Csikvári: *On a conjecture of V. Nikiforov*, Discrete Mathematics **309** (2009), pp. 4522–4526
- P. Csikvári: *On a poset of trees*, Combinatorica **30** (2) (2010), pp. 125–137
- P. Csikvári: *Integral trees of arbitrarily large diameters*, Journal of Algebraic Combinatorics, **32** (3) (2010), pp. 371–377
- P. Csikvári, M. R. Oboudi: *On the roots of edge cover polynomials of graphs*, European Journal of Combinatorics **32** (8) (2011), pp. 1407–1416
- P. Csikvári: *Applications of the Kelmans transformation: extremality of the threshold graphs*, The Electronic Journal of Combinatorics **18** (2011), P182
- P. Csikvári, Z. L. Nagy: *Density Turán problem*, Combinatorics, Probability and Computing **21** (4) (2012), pp. 531–553
- P. Csikvári: *Two remarks on the adjoint polynomial*, European Journal of Combinatorics **33** (4) (2012), pp. 583–591
- P. Csikvári, K. Gyarmati, A. Sárközy: *Density and Ramsey type results on algebraic equations with restricted solution sets*, Combinatorica **32** (4) (2012), pp. 425–449
- P. Csikvári: *On a poset of trees II*, Journal of Graph Theory **74**(1) (2013), pp. 81–103
- P. Csikvári: *Note on the smallest root of the independence polynomial*, Combinatorics, Probability and Computing **22** (1) (2013), pp. 1–8
- P. Csikvári and P. E. Frenkel: *Benjamini-Schramm continuity of root moments of graph polynomials*, European Journal of Combinatorics (Special issue on recent advances in graphs and analysis) **52** (2016), pp. 302–320
- P. Csikvári and Z. Lin: *Graph homomorphisms between trees*, Electronic Journal of Combinatorics **24**(4) (2014), P 4.9
- P. Csikvári and Z. Lin: *Homomorphisms of trees into a path*, SIAM Journal of Discrete Mathematics, **29**(3), pp. 1406–1422.
- M. Abért, P. Csikvári, P. E. Frenkel, G. Kun: *Matchings in Benjamini-Schramm convergent graph sequences*, Transactions of the American Mathematical Society **368** (2016), pp. 4197–4218
- M. Abért, P. Csikvári and T. Hubai: *Matching measure, Benjamini-Schramm convergence and the monomer-dimer free energy*, Journal of Statistical Physics **161** (2015), pp. 16–34
- P. Csikvári: *Lower matching conjecture, and a new proof of Schrijver’s and Gurvits’s theorems*, Journal of European Mathematical Society **19** (2017), pp. 1811–1844
- P. Csikvári: *Matchings in vertex-transitive bipartite graphs*, Israel Journal of Mathematics **215**(1) (2016), pp. 99–134
- P. Csikvári, P. E. Frenkel, J. Hladký and T. Hubai: *Chromatic roots and limits of dense graphs*, Discrete Mathematics **340**(5) (2017), pp. 1129–1135
- P. Csikvári and Z. Lin: *Sidorenko’s conjecture, colorings and independent sets*, Electronic Journal of Combinatorics **24**(1) (2017), P1.2
- E. Cohen, P. Csikvári, W. Perkins and P. Tetali: *The Widom-Rowlinson model, the hard-core model and the extremality of the complete graph*, European Journal of Combinatorics **62** (2017), pp. 70–76

- S. Akbari, P. Csikvári, A. Ghafari, S. Khalashi Ghezelahmad, M. Nahvi: *Graphs with integer matching zeros*, Discrete Applied Mathematics **224** (2017), pp. 1–8
- P. Csikvári and B. Szegedy: *On Sidorenko’s conjecture for determinants and Gaussian Markov random fields*, Random Structures and Algorithms (2022)
- M. Borbényi and P. Csikvári: *Counting degree-constrained subgraphs and orientations*, Discrete Mathematics **343**(6) (2020)
- P. Csikvári and A. Imolay: *Covers, orientations and factors*, The Electronic Journal of Combinatorics **27**(3) (2020), P3.25
- M. Borbényi and P. Csikvári: *Matchings in regular graphs: minimizing the partition function*, Transactions on Combinatorics, 10(2) (2021), pp. 73–95
- M. Borbényi, P. Csikvári and H. Luo: *On the number of forests and connected spanning graphs*, Graphs and Combinatorics **37** (2021), 2655–2678
- P. Csikvári, Á. Schweitzer: *Short survey on stable polynomials, orientations and matchings*, Acta Mathematica Hungarica **166**(1) (2022), 1–16
- F. Bencs, P. Csikvári and G. Regts: *Some applications of Wagner’s weighted subgraph counting polynomial*, Electronic Journal of Combinatorics **28**(4) (2021), P4.14
- F. Bencs, P. Csikvári: *Evaluations of Tutte polynomials of regular graphs*, Journal of Combinatorial Theory, Series B **157** (2022), 500–523
- F. Bencs, P. Csikvári: *Upper bound for the number of spanning forests of regular graphs*, European Journal of Combinatorics (2023)
- Cs. Beke, G. K. Csáji, P. Csikvári and S. Pituk: *Short proof of a theorem of Brylawski on the coefficients of the Tutte polynomial*, European Journal of Combinatorics (2023)
- F. Bencs, P. Csikvári, P. Srivastava and J. Vondrák: *On complex roots of the independence polynomial*, Proceedings of the Symposium on Discrete Algorithms, SODA23 (2023)
- F. Bencs, P. Csikvári and M. Borbényi: *Random cluster model on regular graphs*, Communications in Mathematical Physics (2022)
- P. Csikvári: *Note on the sum of the smallest and largest eigenvalues of a triangle-free graph*, Linear Algebra and its Applications **650**(1) (2022), 92–97
- P. Csikvári, N. Ruozzi, S. Shams: *Markov random fields, homomorphism counting, and Sidorenko’s conjecture*, IEEE Transactions on Information Theory **68**(9) (2022), 6052–6062

Conference talks

- British Combinatorics Conference, St. Andrews, 2009, *Graph transformations in algebraic graph theory*
- Combinatorics 2010, Verbania, *Integral trees of arbitrarily large diameters*
- Number Theory and its Applications, Debrecen, 2010, *Subset sums avoiding quadratic nonresidues*
- British Combinatorics Conference, Exeter, 2011, *Applications of the Kelmans transformation*
- Geometric and Algebraic Combinatorics **5**, 2011, *Applications of the generalized tree shift*
- Algebraic Combinatorics and Graph Theory, Andries Brouwer **60**, 2011, *From density Turán problem to integral trees*

- ICTP-IPM Workshop and Conference in Combinatorics and Graph Theory, Trieste, 2012, *Benjamini-Schramm continuity of root moments of graph polynomials*
- Topology and Geometry of Networks and Discrete Metric Spaces, Institute of Mathematics and its Applications, Minneapolis 2013, *Statistical matching theory* (invited speaker)
- Graph Limits, Groups and Stochastic Processes Workshop, Rényi Alfréd Institute of Mathematics, Budapest, 2014, *Statistical matching theory* (invited speaker)
- Groups, Graphs and Stochastic Processes, Banff 2015, *Statistical matching theory* (invited speaker)
- Spectra of Graphs and Hypergraphs, AMS meeting, Memphis 2015 (invited section speaker)
- Extremal and Probabilistic Combinatorics, AMS meeting, Fargo, 2016 (invited section speaker)
- Graph Limits and Statistics, Cambridge, 2016 (invited speaker)
- Workshop on Graph Limit Theory, Janov, 2018 (invited speaker)
- Summer School on Graph Limit Theory, Budapest, 2018 (lecturer)
- Building Bridges II, Celebrating the Work of László Lovász, Budapest, 2018, (invited speaker, mini talk)
- Introduction to Partition Functions, EPFL, Lausanne, 2018 (invited speaker)
- Partition Functions and Computational Complexity, Amsterdam, 2018 (invited speaker)
- Theoretical Challenges in Partition Functions, EPFL, Lausanne, 2018 (invited speaker)
- Applications of Partition Functions, EPFL, Lausanne, 2018 (invited speaker)
- Deterministic Counting, Probability, and Zeros of Partition Functions, UC Berkeley, Simons Institute, 2019 (invited speaker)
- CanaDAM, 2021 (invited section speaker)
- DIMACS Workshop on Entropy and Optimization, online, 2022 (invited speaker)
- Graphs, Groups, Stochastic Processes Workshop, Rényi Institute, Budapest, 2022 (invited speaker)
- Graphs, Groups, Stochastic Processes Summer School, Rényi Institute, Budapest, 2022 (lecturer)
- AMS-EMS-SMF meeting, Grenoble, 2022 (invited section speaker)
- Graph Limits, Non-parametric Models, and Estimation Workshop, UC Berkeley, Simons Institute, 2022 (invited speaker)

Selected seminar talks

- University of California, Berkeley, Geometry of Polynomials seminar, 2019
- London School of Economics, Combinatorics seminar, 2017
- Massachusetts Institute of Technology, Combinatorics seminar, 2014, 2015, 2016
- Georgia Institute of Technology, Combinatorics seminar, 2015
- Cornell University, Probability seminar, 2015