CV: Henna Koivusalo

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Date of birth: August 20, 1985
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Education

Doctor of Philosophy in Mathematics, University of Oulu, Finland, 17 September 2013
Master of Philosophy in Mathematics, University of Jyväskylä, Finland, 9 December 2009
Bachelor of Science in Mathematics, University of Jyväskylä, Finland, 11 November 2009

Employment history

Lecturer, University of Bristol, UK: July 27, 2020 - present[1]

Habilitation Position, University of Vienna, Austria: October 1, 2016 - July 27, 2020[2]

Postdoctoral Researcher, University of York, UK: October 9, 2013 - September 30, 2016

- Funded by Alan Haynes's EPSRC projects on Diophantine approximation and aperiodic order, and a 1-year scholarship from Osk. Huttunen foundation.

Publications

1. H. Koivusalo, J. Walton: Cut and project sets with polytopal window II: linear repetitivity, pp 1-52, arXiv: 2012.00591, to appear in *Trans. Amer. Math. Soc.*
2. H. Koivusalo, L. Liao, T. Persson: Uniform random covering sets, *Int. Math. Res. Not.* (2021) https://doi.org/10.1093/imrn/rnab272.
3. H. Koivusalo, M. Rams: Mass transference principle: from balls to arbitrary shapes. *Int. Math. Res. Not.* 2021 (2021), no. 8, 6315–6330.
4. H. Koivusalo, J. Walton: Cut and project sets with polytopal window I: complexity. *Erg. Theory Dynam. Systems.* (2020), https://doi.org/10.1017/etds.2020.10.
5. A. van Enter, H. Koivusalo, J. Miekisz: Sturmian ground states in classical lattice-gas models. *J. Stat. Phys.* 178 (2020), no. 3, 832–844.
6. J. Furno, A. Haynes, H. Koivusalo: Bounded remainder sets for rotations on the adelic torus. *Proc. Amer. Math. Soc.* 147 (2019), 5105-5115.
7. A. Haynes, A. Julien, H. Koivusalo, J. Walton: Statistics of patterns in typical cut and project sets. *Ergodic Theory Dynam. Systems.* 39 (2019), Issue 12, 3365-3387.
8. H. Koivusalo, M. Rams: Dimension of generic self-affine sets with holes. *Monatsh. Math.* 188 (2019), no. 3, 527–546.
9. B. Bárány, A. Käenmäki, H. Koivusalo: Dimension of self-affine sets for fixed translation vectors. *J. Lond. Math. Soc.* (2) 98 (2018), no. 1, 223–252.

[1] Parental Leave: December 18, 2020 - June 17, 2021
[2] Parental Leave, October 28, 2018 - December 11, 2019

10. A. Haynes, H. Koivusalo, J. Walton: Perfectly ordered quasicrystals and the Littlewood conjecture. *Trans. Amer. Math. Soc.* 370 (2018), no. 7, 4975–4992.
11. H. Koivusalo, F. Ramírez: Recurrence to shrinking targets on typical self-affine fractals. *Proc. Edinburgh Math Soc.* 61 (2018), no. 2, 387–400.
12. A. Haynes, H. Koivusalo, J. Walton: Characterization of linearly repetitive cut and project sets. *Nonlinearity* 31 (2018), no. 2, 515–539.
13. A. Käenmäki, H. Koivusalo, E. Rossi: Self-affine sets with fibered tangents. *Ergodic Theory Dynam. Systems* 37 (2017), no. 6, 1915–1934.
14. E. Järvenpää, M. Järvenpää, H. Koivusalo, B. Li, V. Suomala, Y. Xiao: Hitting probabilities of random covering sets in torus and metric spaces. *Electron. J. Probab.* 22 (2017), no. 1, 18 pp.
15. A. Haynes, H. Koivusalo: A randomized version of the Littlewood Conjecture. *J. Number Theory* 178 (2017), 201–207.
16. A. Haynes, M. Kelly, H. Koivusalo: Constructing bounded remainder sets and cut-and-project sets which are bounded distance to lattices, II. *Indag. Math. (N.S.)* 28 (2017), no. 1, 138–144.
17. A. Haynes, H. Koivusalo, L. Sadun, J. Walton: Gaps problems and frequencies of patches in cut and project sets. *Math. Proc. Camb. Phil. Soc.* 161 (2016) 65–85.
18. A. Haynes, H. Koivusalo: Constructing bounded remainder sets and cut-and-project sets which are bounded distance to lattices. *Israel J. Math.* 212 (2016), no. 1, 189–201.
19. C. Chen, H. Koivusalo, B. Li, V. Suomala: Projections of random covering sets. *J. Fractal Geom.* 1 (2014), no. 4, 449–467.
20. E. Järvenpää, M. Järvenpää, H. Koivusalo, B. Li, V. Suomala: Hausdorff dimension of affine random covering sets in torus. *Ann. Inst. Henri Poincaré Probab. Stat.* 50 (2014), no. 4, 1371–1384.
21. E. Järvenpää, M. Järvenpää, A. Käenmäki, H. Koivusalo, Ö. Stenflo, V. Suomala: Dimensions of random affine code tree fractals. *Ergodic Theory Dynam. Systems* 34 (2014), no. 3, 854–875.
22. H. Koivusalo: Dimension of uniformly random self-similar fractals. *Real Anal. Exchange* 39 (2013/14), no. 1, 73–90.

Preprints

1. J. Fraser, H. Koivusalo, F. Ramirez: Diophantine approximation in metric space, pp 1-17 (2021) arXiv: 2105.06776.

Grants and scholarships

collaboration grant (5400 e)	Austrian Agency for International Cooperation in Education and Research: Collaboration of IMPAN, Poland and University of Vienna, Austria (joint application with Profs Bruin and Rams), April 28, 2017
travel grant (2000 e)	Väisälä foundation: Visit to Mittag-Leffler Institute in Stockholm, December 12, 2016
one-year postdoctoral scholarship (35 000 e)	Osk. Huttunen foundation: September 9, 2013 (used at the University of York, academic year 15/16)
travel grant (2000 e)	Oskar Öflund foundation and University of Oulu Graduate School: Conference trip to Hongkong, research visit to Guangzhou, China, May 14, 2012 and June 7, 2012

travel grant (500 e)	Oskar Öflund foundation: Conference in the Netherlands, May 9, 2011
travel grant (1700 e)	University of Oulu, Faculty of Natural Sciences: Research visit to Hongkong, February 10, 2011
one-year PhD-student scholarship (21 000 e)	Jenny and Antti Wihuri foundation: October 10, 2010 (used at the University of Oulu, 11/12)

Selected invited talks (63 invited talks, 14 online during COVID-pandemic)

June 2021	Workshop on Deterministic Extremes and Recurrence, Exeter, UK: Path-dependent, shrinking, moving targets and beyond, on generic self-affine sets (online)
March 2021	Colloquium, Durham University, UK: Repetition in aperiodically ordered patterns (online)
June 2020	Fractals and Related Fields 4: Mass transference principle: From balls to arbitrary shapes (online)
September 2019	Lund University, Sweden, seminar: Mass transference principle: From balls to arbitrary shapes
April 2019	One day ergodic theory meeting, Loughborough, UK: Mass transference principle: From balls to arbitrary shapes
July 2018	Mathematical physics of non-periodic structures, Bedlewo, Poland: An introduction to cut and project sets
December 2017	Tiling and Recurrence, CIRM, Luminy, Marseille, France: Cut and project sets, linear repetition of patterns, and the Littlewood conjecture
September 2017	Fractal Geometry and Dynamics semester programme, Mittag-Leffler Institute, Stockholm, Sweden: Dimension of self-affine sets for fixed translation vectors
August 2017	London Mathematical Society Scheme 2 funded lecture tour on dimensions of self-affine sets via Durham, Glasgow and St Andrews
March 2016	Imperial College, London, seminar: Self affine sets with a fibered tangent structure
March 2016	British Mathematical Colloquium, Bristol, UK: Cut and project sets and Diophantine approximation
February 2016	Ergodic, Algebraic and Combinatorial Methods in Dimension Theory, ICERM, Brown University, USA: Cut and project sets and Diophantine approximation
October 2015	Arbeitsgemeinschaft: Mathematical Quasicrystals, Oberwolfach, Germany: Cohomology for cut and project pattern spaces
June 2015	30th Summer Conference on Topology and its Applications, Galway, Ireland: Describing pattern repetition in cut and project sets

Service

- External examiner at a PhD defence, University of York, UK, October 2021
- External examiner at a PhD defence, Chalmers University of Technology, Göteborg, Sweden, April 2019
- Advisor/referee for several journals, including Selecta Mathematica, Mathematical Proceedings of the Cambridge Philosophical Society, Bulletin of London Mathematical Society, Monatshefte für Mathematik and Journal of Fractal Geometry

Teaching and supervision

- 1 PhD student, due to finish in 2025
- Supervision of 3 final year 20 cp projects on topology of tiling spaces, University of Bristol, academic year 21/22
- Supervision of a Bachelor project in fractal geometry, University of Vienna, academic year 19/20,
- Lecturing and course design, University of Vienna, academic year 17/18: Master's level course in Fractal Geometry
- Supervision of a Bachelor project in fractal geometry, University of Vienna, academic year 17/18
- 3 proseminars at the University of Vienna, academic years 16/17 and 17/18: Probability and Statistics (second year), Measure Theory (Master's level), Dynamical Systems (Master's level)
- Twice the lecturer of the (third year) course Metric Spaces, University of York, autumn terms 2014 and 2015
- Teaching assistant for the following 8 courses at the Universities of Oulu and Jyväskylä: Fractal geometry, Continuity and limits, Euclidean topology, Linear algebra 1, Euclidean spaces, Geometry, Approbatur 2A, Approbatur 2B.

Outreach

- Ran a session as part of the Access to Bristol series to Y12/13 students interested in studying mathematics at university, December 2021
- Collaboration with the School of Mathematics composer-in-residence Liam Taylor-West, academic year 2020/21
- 2 talks on the career of a mathematician: one at University of Bristol to women and non-binary undergraduate students considering a PhD, November 2020, and one at University of Oulu to fist year students, December 2020 (both online)
- Ran the training sessions for about 7 volunteers to present at the Pi-Day event in Vienna, March 2020 (the event itself got cancelled due to the COVID-pandemic)
- For 2 years ran the Further Maths Programme for Y12/13 students preparing for mathematics university degree, University of York, 2014-2016.
- 3 talks to general audiences:
  - public lecture: LMS Northern regional meeting on Dynamical Systems, Ergodic Theory and Applications, Manchester, June 2016
  - Speaker at the University of York Open Days for prospective students, June 2015
  - York Maths Student Society public lecture on Extreme Complexity of Fractal Sets, February 2014 (available online www.youtube.com/watch?v=rdhy3WLKUY0)
- Presenter at the MegaJam -event at the National STEM Centre in York, May 2015