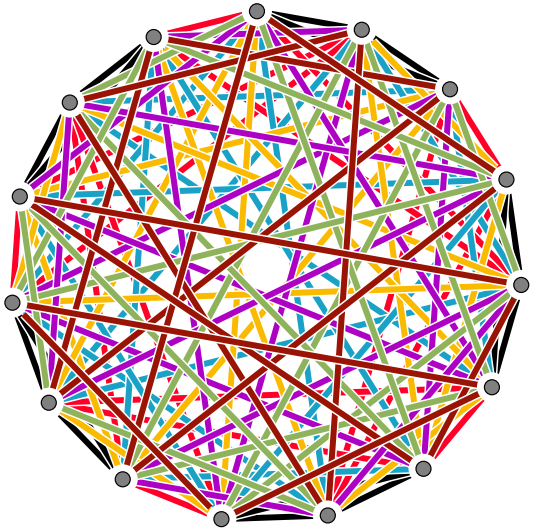
Berlin Mathematics Research Center MATH+

Berlin Mathematical School BMS

MATH+ Friday Colloquium

Friday, 5 December 2025 at 14:15

TU Berlin, Math Building, Straße des 17. Juni 136, Room MA 042 *Tea & Cookies starting at 13:00*



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Julia Böttcher

(LSE)

Randomness, quasirandomness, and decomposition problems

The use of random processes and of various notions of quasirandomness continue to play a crucial role in extremal combinatorics. One direction where this has led to spectacular progress in the past decade concerns graph and hypergraph decomposition problems. Questions about the existence of combinatorial designs, the problem of constructing Latin squares with certain properties, graph and hypergraph packing problems, and certain graph labelling questions can all be phrased in the language of decomposition problems, making them an important object of study.

In this talk, Böttcher will introduce the area of graph and hypergraph decompositions, with background, motivation, and some history. She will then concentrate on some illustrative examples of important questions researchers have looked at, indicating how randomness and quasirandomness are instrumental for tackling these problems, and also mention interesting conjectures that remain open.

After studying Computer Science at HU Berlin and the University of Toronto, Julia Böttcher obtained her PhD in Mathematics from TU München, before moving to São Paulo as a postdoctoral fellow. Since 2012, she has lived in London with her family and has worked as a Professor in Mathematics at the London School of Economics and Political Science. She was awarded a Fulkerson Prize in 2018 and was an invited sectional speaker at the 2022 International Congress of Mathematicians.