University of Birmingham

A Summer Day of Ramsey Theory

13th July 2026

Rainbow paths in edge-coloured graphs
Candy Bowtell

Let K_n be properly edge-coloured, meaning that no two edges with the same colour are incident to the same vertex. It is natural to ask for which graphs H we can find a rainbow copy of H, that is, a copy using at most one edge of each colour, in any proper edge-colouring of K_n. In 1989, Andersen conjectured that every properly edge-coloured K_n contains a rainbow path covering at least $n-1$ vertices. That is, a path which uses any colour at most once. We confirm this conjecture for sufficiently large n, moreover, showing that when at least n colours are used, one can find a rainbow Hamilton path. Our proof combines results of Montgomery on rainbow matchings in bipartite graphs with a novel relaxation of a sorting network.

This is joint work with Richard Montgomery, Alp Müyesser and Alexey Pokrovskiy.

Odd-Ramsey numbers of Hamilton cycles
Simona Boyadzhiyska

We will discuss a new variant of the classic Ramsey problem, arising from Alon's work on graph codes. The odd-Ramsey number $r_{\text{odd}}(n, H)$ of a graph H is the minimum number of colors r such that there exists an r-coloring of the edges of K_n with the property that every copy of H in K_n intersects some color class in an odd number of edges. In this talk, we will first give a general introduction to this relatively new topic and then discuss recent results concerning odd-Ramsey numbers of Hamilton cycles.

This is joint work with Shagnik Das, Thomas Lesgourgues, and Kalina Petrova.

Infinite Ramsey theory for finite graph-theorists
Louis DeBiasio

TBA

Ramsey-type problems for tilings
Andrea Freschi

Given a graph H and an integer $m \geq 1$, we write mH to denote the graph consisting of m vertex-disjoint copies of H. Members of the family $\{mH : m \in \mathbb{N}\}$ are called *H-tilings*.

Ramsey numbers of tilings are well-understood. A seminal result of Burr, Erdős and Spencer states that $R(mH) = (2|V(H)| - \alpha(H)) \cdot m + C$ for any $m \geq m_0$, where m_0 and C are constants depending on H, and $\alpha(H)$ is the independence number of H. Burr provided an algorithm to compute C explicitly, and Bucić and Sudakov obtained sharp bounds for m_0.

In this talk, we explore several variations of these Ramsey-type questions. For example, we consider the problem of finding a monochromatic copy of mH within a graph that is not necessarily complete, namely the random graph $G(n, p)$ and graphs with large minimum degree.

This is based on joint work with József Balogh, Ryan Martin and Andrew Treglown.

Ramsey numbers of trees and beyond
Matías Pavez-Signé

The study of the Ramsey number of a general tree started in the 1970s when two cornerstone conjectures were proposed: the Burr–Erdős conjecture and the Burr conjecture. In this talk, I will show recent results around both conjectures, including the solution of Burr's conjecture for trees with small degree, a resilience version of the Burr–Erdős conjecture for bounded-degree trees, and the first steps towards a hypergraph version of this problem.