Department of Mathematics,
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Math 269 - Combinatorics

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Monochromatic connected matchings, paths and cycles in 2-edge-colored multipartite graphs

Abstract:

For every fixed s and large n, we describe all values of $n_1, \ldots, n_s$ such that for every 2-edge-coloring of the complete s-partite graph $K_{n_1,\ldots,n_s}$ there exists a monochromatic (i) cycle C_{2n} with $2n$ vertices, (ii) cycle $C_{\geq 2n}$ with at least $2n$ vertices, (iii) path P_{2n} with $2n$ vertices, and (iv) path P_{2n+1} with $2n+1$ vertices. This implies a generalization of the conjecture by Gyárfás, Ruszinkó, Sárkőzy and Szemerédi that for every 2-edge-coloring of the complete 3-partite graph $K_{n,n,n}$ there is a monochromatic path P_{2n+1}.

An important tool is our recent stability theorem on monochromatic connected matchings (A matching M in G is connected if all the edges of M are in the same component of G). We will also talk about exact Ramsey-type bounds on the sizes of monochromatic connected matchings in 2-colored multipartite graphs. Joint work with József Balogh, Alexandr Kostochka and Mikhail Lavrov.

Host: Ruth Luo

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2:00 PM
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