Abstract

On the spouse-loving variant of the Oberwolfach Problem

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In the 1960s, Ringel posed the Oberwolfach Problem: at a conference with v attendees, the dining room has tables of sizes $n_1, n_2, \ldots, n_t$, where $n_1 + n_2 + \cdots + n_t = v$. Is it possible to find a seating plan over successive nights of the conference so that each person sits next to each other person exactly once?

In graph-theoretical terms, Ringel's problem asks for a 2-factorization of K_v in which each 2-factor is isomorphic to a given 2-factor $\mathcal{F}$. Such a factorization of the complete graph can exist only if v is odd. For even orders, it is common to study the maximum packing variant, in which we factor $K_v - I$, the complete graph with the edges of a 1-factor removed; this is sometimes referred to as the spouse-avoiding variant. In this talk, we consider the minimum covering version, which we nickname the spouse-loving variant. Here, given a 2-factor $\mathcal{F}$ of even order v, we seek an $\mathcal{F}$-factorization of $K_v + I$, the complete graph with the edges of a 1-factor duplicated. We discuss the problem in the cases that the 2-factor $\mathcal{F}$ is uniform or bipartite.

This talk includes joint work with Noah Bolohan, Iona Buchanan, Mateja Šajna and Ryan Van Snick.