MATEJA ŠAJNA, University of Ottawa

A recursive approach to the Oberwolfach problem and its variants

The celebrated Oberwolfach problem (OP), first posed by Ringel in 1967, asks whether n participants at a conference can be seated at k round tables of sizes $m_1, \ldots, m_k$ (where $m_1 + \ldots + m_k = n$) for several meals so that everybody sits next to everybody else exactly once. OP can be modeled as a decomposition of the complete graph K_n into 2-factors, each consisting of k disjoint cycles of lengths $m_1, \ldots, m_k$.

For cycles of uniform length, OP was solved decades ago, and it has recently been shown that it has a solution for all sufficiently large n. In addition, many infinite families of cases with variable cycle lengths (e.g. the two-table case and the bipartite case) are known to have a solution, however, in general, OP is still open and highly relevant. Moreover, many variants, each modeling a different seating arrangement, have been investigated recently.

In this talk, I will describe a recursive approach that allows us to use a solution to a smaller case of OP or variant to construct a solution to a larger case (typically adding one sufficiently long cycle). This approach has already been used successfully to obtain new solutions to several infinite families of cases of the directed OP (for complete symmetric digraphs), and I will outline my plans for some of the other variants. This talk will also serve as an introduction to the talks by Marie Rose Jerade and Josephine Brooks.