

Graphs, groups, and more: celebrating Brian Alspach's 80th and Dragan Marušič's 65th birthdays

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Some Variations on the Oberwolfach Theme

Last year marked the 50th anniversary of the Oberwolfach Problem, which was formulated in 1967 by Gerhard Ringel as follows:

“At a conference in Oberwolfach, $2k + 1$ participants are to be seated at t round tables for k meals so that each participant sits next to every other participant at exactly one meal. Can this be achieved with tables of sizes m_1, m_2, \dots, m_t if $m_1 + m_2 + \dots + m_t = 2k + 1$?”

This basic variant of the Oberwolfach Problem can be modeled as a decomposition of the complete graph K_{2k+1} into 2-factors, each of these 2-factors consisting of t disjoint cycles of lengths m_1, m_2, \dots, m_t . The problem was later extended to $K_{2k+2} - I$, the complete graph of even order minus a 1-factor, and in this form nicknamed the Spouse-Avoiding Variant.

The case of uniform cycle lengths for both the original and the Spouse-Avoiding Variant was completely solved in a series of papers published between 1973 and 1991, and Brian Alspach co-authored two of the most comprehensive of these papers.

Over the last few decades, many other cases of the Oberwolfach Problem have been solved, however, the general problem is still open. In this talk, I will give an overview of the most prominent solved cases, and then focus on the variants of the problem that I have been involved with: the directed Oberwolfach Problem, the Spouse-Loving Variant (or the minimum covering variant), and the Honeymoon Oberwolfach Problem.

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