Abstract: Let $\Gamma$ be a graph of order $v$, and let $F$ be a spanning 2–regular subgraph of $\Gamma$. A collection of 2–regular graphs isomorphic to $F$ whose edges partition the edge-set of $\Gamma$ is called an $F$–factorization of $\Gamma$.

Given any 2–regular graph $F$ of order $v$, I will consider the problem of determining whether there exists an $F$-factorization of $\Gamma = K_v$ or $\Gamma = K_v - I$ (i.e., the complete graph minus the 1-factor $I$) according to whether $v$ is odd or even. This problem, known as the Oberwolfach problem $\text{OP}(F)$, has drawn much interest since it was first posed by Ringel in 1967, for $v$ odd, and then extended to the even case by Huang, Kotzig and Rosa in 1979.

The relevance of this problem, which is still open in general when $F$ has at least three cycles, is proven by the very recent results achieved for an infinite set of prime orders, when all cycles have even lengths, and in the case where $F$ consists of exactly two cycles.

In this talk I will present some results concerning this problem and its variants, achieved through a particular kind of graph labelings and difference methods. Moreover, I will discuss some problems concerning the symmetries of our constructions.

All Faculty, staff, students and guests are welcome to attend