

## Perfect and Uniform One-factorizations of the Complete Graph

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A one-factorization  $\{F_1, \dots, F_{2n-1}\}$  of  $K_{2n}$  is *uniform* if the graphs with edge sets  $F_i \cup F_j$  are all isomorphic for  $i \neq j$ . Since the union of two one-factors is a 2-regular graph which is 2-edge-colorable, it is isomorphic to a disjoint union of even cycles. In this talk we will survey what is known about the cycle structure of uniform one factorizations of the complete graph. We will then concentrate on one-factorizations which arise from starters in the additive group of finite fields. We give some general conditions for the existence of  $k$ -cycles, then specialize this to the cases  $k = 4, 6$ , completely characterizing the four-cycle case.

We also introduce the notion of sequentially perfect and uniform one-factorizations of the complete graph and discuss the existence of these objects.