A \( \lambda \)-fold \( G \)-design of order \( n \) is a pair \((X, B)\), where \( B \) is a collection of edge disjoint copies of the simple graph \( G \) which partitions the edge set of \( \lambda K_n \) (the undirected complete graph with \( n \) vertices) with vertex set \( X \).

Let \((X, B)\) be a \( G \)-design and \( H \) be a subgraph of \( G \). For each block \( b \in B \), partition \( b \) into copies of \( H \) and \( G \setminus H \) and place the copy of \( H \) in \( B(H) \) and the edges belonging to the copy of \( G \setminus H \) in \( D(G \setminus H) \). Now if the edges belonging to \( D(G \setminus H) \) can be arranged into a collection \( D(H) \) of copies of \( H \), then \((X, B(H) \cup D(H))\) is a \( \lambda \)-fold \( H \)-design of order \( n \) and called a metamorphosis of the \( \lambda \)-fold \( G \)-design \((X, B)\) into a \( \lambda \)-fold \( H \)-design.

The first papers, in which the term “metamorphosis” was introduced for graph designs, were published in the beginning of 21st century for the case \((G, H) = (K_4, C_4)\) by Lindner and Street, where \( C_4 \) is a 4-cycle and for the case \((G, H) = (K_4, K_3)\) by Lindner and Rosa. The metamorphosis problem was first considered from a different perspective by Bryant earlier in 1996 while he was solving a problem on nested Steiner triple systems. Then various researchers; Billington, Dancer, Küçükçifçi, Lindner and Rosa gave constructions on the problem for \( G = K_4 \) and all possible subgraphs \( H \) of \( G \) in a series of papers. Variations of the problem such as full metamorphosis, simultaneous metamorphosis and maximum packings in metamorphosis problems have been studied from then on.

In this talk, these problems will be presented and recent developments will be explained.