

# 4 Manifolds

Mehmetcik Pamuk  
*Koc University*

Manifolds are the central geometric objects in modern mathematics. One important question in topology is to classify manifolds. The flavor of the classification of manifolds depends heavily on the dimension. Manifolds of dimension 1 and 2 have been well understood. In dimension 3 the classification is hard (but maybe solved). In greater than equal to 4 dimensions, it is provably impossible. Since a complete answer to the classification is not possible one has to fix certain invariants in such a way that the classification is in principle possible.

In this talk, first I will try to explain why dimension 4 is unlike any other dimension and then focus on 4 manifolds with free or surface fundamental groups.