A Glimpse of Group Actions on Spaces

Semra Pamuk

Middle East Technical University, Ankara, Turkey
`pasemra@metu.edu.tr`

The idea of a group action is related to basic intuitions on the notion of symmetry. Some groups occur naturally as acting on spaces. In the area of group actions on topological spaces or manifolds, one studies the symmetries of such objects or subgroups of the full group of symmetries. The study of group actions on topological spaces brings together many different areas of mathematics. Tools from the algebra of group itself, from algebraic topology of the space, from geometry of manifolds, from representation theory and other areas are brought together to answer questions about which groups act on a space, in which ways a group can act and what geometric information is preserved by a group action etc.

In this talk, we aim to give some basic definitions and a broad view of group actions on topological spaces, especially on manifolds. In particular, we will present a survey of some of the main results of group actions on spheres and product of spheres and some open problems.

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