Geometric Structures in Group Theory

Abstract

The proposal *Geometric Structures in Group Theory* is rooted in the vibrant mathematical field of geometric group theory, wherein one seeks to understand groups via suitable actions on spaces endowed with enlightening geometric and analytic structures. As with previous similar conferences organized in Oberwolfach, we try to strike a good balance between vibrant mainstream directions of research and recent breakthrough advances that suggest new directions. In what follows, these aspects have been classified into three themes.

1. Classical Geometric Group Theory

    - Groups acting on hyperbolic spaces
    - Groups acting on CAT(0)-spaces
    - Mapping class groups $\mathrm{MCG}(S_g)$ and $\mathrm{Out}(F_n)$
    - Finiteness properties and filling invariants

2. Profinite Groups, Geometry and Topology

    - Profinite rigidity
    - Higher-dimensional hyperbolic groups
    - Connections with buildings and Lie theory

3. Connections with Analysis

    - Higher property (T) and higher expanders
    - Property (T) and (τ): algebraic criteria
    - L^p-cohomology
    - Connections with operator algebras