

Dynamics of group actions on homogeneous spaces

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Investigating rigidity phenomena in the context of dynamics of group actions on homogeneous spaces has attracted considerable attention over the past several years. One reason for the immense research conducted in this area is the fact that such results have far reaching consequences in other fields. Indeed, the proof of the Oppenheim conjecture and its quantitative versions, proof of the arithmetic quantum unique ergodicity, an important partial result towards the Littlewood conjecture are all fruits of such studies.

In this short course we give an overview of the main results in the area. We will then briefly discuss the following space of lattices in \mathbb{R}^n , ergodicity and mixing properties of flows on homogeneous spaces, non-divergence properties of unipotent flows. a special case of Ratner's measure classification theorem (using a concrete example), if time permits, we will also discuss an isolation theorem for closed orbits semisimple groups in homogeneous spaces.

<http://www.claymath.org/library/proceedings/cmip010c.pdf>