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**Title: Geometry and analysis of locally symmetric spaces of infinite volume**

Abstract: For any symmetric space X of noncompact type, its quotients by torsion-free discrete isometry groups Œì are locally symmetric spaces.
One problem is to understand the geometry and analysis, especially the spectral theory, and interaction between them of such spaces.

Two classes of infinite groups Œì have been extensively studied:

(1) Œì is a lattice, and hence Œì \ X has finite volume.
(2) X is of rank 1, for example, when X is the real hyperbolic space, Œì is geometrically finite and Œì \ X has infinite volume.

When Œì is a nonuniform lattice in case (1) or any group in case (2), compactification of Œì \ X and its boundary play an important role in the geometric scattering theory of Œì \ X.

When X is of rank at least 2, quotients of X of finite volume have also been extensively studied.
There has been a lot of recent interest and work to understand quotients Œì \ X of infinite volume. For example, there are some generalizations of convex cocompact groups, but no generalizations yet of geometrically finite groups. They are related to the notion of thin groups.

One naturally expects that these locally symmetric spaces should have real analytic compactifications with corners (with codimension equal to the rank), and their boundary should also be used to parametrize the continuous spectrum and to understand the geometrically scattering theory. These compactifications also provide a natural class of manifolds with corners.
In this talk, I will describe some questions, open problems and results.