Geometry, Groups and Dynamics/GEAR Seminar
(held at the Illinois hub of GEAR)

Thursday, February 26, 2015, 1:00 pm in 243 Altgeld Hall

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Higher rank geometric structures

Abstract: Suppose G is a Lie group acting transitively on a manifold X. Then a (G,X)-structure on a manifold M is a collection of coordinate charts whose images are in X and whose transition functions are in G. Some classic examples include the locally symmetric spaces, real projective manifolds, complex projective manifolds, and affine manifolds. In this talk we will consider (G,X)-structures where X is a compact G-space having "higher rank" in the sense that G does not act two-transitively on X. For instance, the complete flag variety of a real vector space with dimension at least two is a higher rank $SL_d(\mathbb{R})$-space. We will show that a higher rank geometric structure on a manifold restricts the fundamental group. In particular, a manifold with Gromov hyperbolic fundamental group cannot have a proper (G,X)-structure when $G=SL_d(\mathbb{R})$ and X is a higher rank compact G-space.

Video