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Mathematics Colloquium

Affine geometry and the Auslander Conjecture

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Abstract

The Auslander Conjecture is an analogue of Bieberbach's theory of Euclidean crystallographic groups in the setting of affine geometry. It predicts that a complete affine manifold (a manifold equipped with a complete torsion-free flat affine connection) which is compact must have virtually solvable fundamental group. The conjecture is known up to dimension six, but is known to fail if the compactness assumption is removed, even in low dimensions. We discuss some history of this conjecture, give some basic examples, and then sketch a new construction of non-compact complete affine manifolds with non-solvable fundamental group whose cohomological dimension is arbitrarily large. At the heart of the issue is understanding the dynamics of discrete groups acting by affine transformations of $\mathbb{R}^n$.

Wednesday, 30 March 2016, 4pm

Smith Hall 204

Tea and refreshments will be served at 3:45pm.