

- **Nguyen-Phan, Tam: A geometric analogue of the rational Tits building in nonpositive curvature (SR 0)**

Locally symmetric manifolds of noncompact type form an interesting class of nonpositively curved manifolds. The topology of the end of an arithmetic locally symmetric space is controlled by an arithmetically-constructed object called the "rational Tits building". The rational Tits building can be thought of abstractly or as a subset of the visual boundary of the universal cover of M and is homotopically a wedge of spheres of dimension $q-1$, where q is the "Q-rank" of the locally symmetric space. In general, q is less or equal than half the dimension of the locally symmetric space. We show that this is not an arithmetic phenomenon but a consequence of nonpositive curvature alone. We build a geometric analog of the rational Tits building for general noncompact, finite volume, complete, n -manifolds of bounded nonpositive curvature. We use this to show that any polyhedron, in the thin part (i.e. the end) of M that lifts to the universal cover can be homotoped within the thin part of M to one with dimension less or equal than $(n/2 - 1)$. Loosely speaking, this says that any topological feature that survives from being pushed to infinity must be in dimension less than $n/2$. I will describe how this is done. This is joint work with Grigori Avramidi. This talk is about nonpositively curved geometry. No knowledge of Tits buildings is required (or will be given).