

The Classification of Affine Buildings

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In this mini-course we will give an overview of the classification of Bruhat-Tits buildings. By Bruhat-Tits building we mean an irreducible affine building Δ of rank $\ell \geq 3$ whose building at infinity Δ^∞ is Moufang. (The building at infinity Δ^∞ is an irreducible spherical building of rank $\ell - 1$. Thus if $\ell \geq 4$, Δ^∞ is automatically Moufang. In other words, all irreducible affine buildings of rank $\ell \geq 4$ are Bruhat-Tits buildings.)

Lecture 1: A description of the classification of Moufang spherical buildings (of rank at least two) in terms of root data.

Lecture 2: The building at infinity and the “tree structure” of an affine building.

Lecture 3: Valuations of root data.

Lecture 4: An overview of the classification of Bruhat-Tits buildings in terms of valuations of root data.

A spherical building of rank two is the same thing as a generalized polygon. In all of these lectures we will focus on a few examples where the building at infinity Δ^∞ is either a generalized triangle or a generalized quadrangle.