

Seminarium geometrów

<https://dgt.math.uni.wroc.pl/>

Poniedziałek, 2.11.2026, 14:15 WS

Christopher H. Cashen (Technische Universität Wien)

Hierarchical hyperbolicity of Coxeter groups

Abstract: Coxeter groups are generated by reflections, and their geometry can be spherical, Euclidean, hyperbolic, or a complex mixture of all three. These talks describe how hyperbolic geometry can be used to understand the whole class.

The first part will introduce Coxeter groups and their geometric models. We will discuss Morse geodesics, which capture hyperbolic behavior in spaces that need not be hyperbolic, and explain how collapsing certain parabolic subspaces produces a hyperbolic model that detects precisely these geodesics.

The second part will introduce hierarchical hyperbolicity as a scheme for describing a space through compatible hyperbolic coordinates. Starting with coordinate axes in Euclidean space and products of trees, we will explain how to construct such coordinates for Coxeter groups. The construction initially leaves certain Euclidean pieces as peripheral domains. Decomposing these pieces into coordinate directions, while controlling the group action, shows that every finitely generated Coxeter group has a finite-index subgroup that is a hierarchically hyperbolic group. Consequences include coarse median structures and quasi-isometries to finite-dimensional CAT(0) cube complexes.

This is joint work with Michelle Chu and Jing Tao.

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