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Subspace stabilizers in hyperbolic lattices

I will speak about a recent joint work with Mikhail Belolipetsky (IMPA, Brazil), Nikolay Bogachev (University of Toronto) and Leone Slavich (University of Pavia). It turns out that properly immersed totally geodesic m-dimensional suborbifolds of n-dimensional arithmetic hyperbolic orbifolds ($m < n$) correspond to finite subgroups of the commensurator given a simple condition on m and n. We refer to such suborbifolds as "finite commensurator subgroup subspaces" (or fc-subspaces for short) and use them to formulate an arithmeticity criterion: a hyperbolic orbifold is arithmetic if and only if it contains infinitely many fc-subspaces. I will start by providing a short survey of arithmetic manifolds, and then move to showcasing some of the results that we obtained. Time permitting, I will also discuss some ideas behind the proofs.