

Finiteness properties, subgroups of hyperbolic groups and complex hyperbolic lattices, Claudio Llosa

Abstract: Hyperbolic groups form an important class of finitely generated groups that has attracted much attention in Geometric Group Theory. We call a group of finiteness type F_n if it has a classifying space with finitely many cells of dimension at most n , generalising finite presentability, which is equivalent to type F_2 . Hyperbolic groups are of type F_n for all n and it is natural to ask if their subgroups inherit these strong finiteness properties. We use methods from complex geometry to show that every uniform arithmetic lattice with positive first Betti number in $PU(n, 1)$ admits a finite index subgroup, which maps onto the integers with kernel of type F_{n-1} and not F_n . This answers an old question of Brady and produces many finitely presented non-hyperbolic subgroups of hyperbolic groups. This is joint work with Pierre Py.