

Polyhedral complexes, lattices and surface subgroups

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We begin with examples of polyhedral complexes X which may be naturally equipped with a metric so that they become cube complexes.

If X is locally finite then $G = \text{Aut}(X)$ is naturally a locally compact group, and a cocompact lattice in G is precisely a subgroup of G which acts cocompactly on X with finite stabilisers. We will survey the known constructions of cocompact lattices in such G . In the case that X is δ -hyperbolic, we may conclude by Agol's work that these lattices are virtually special. We then focus on the case of X a right-angled building and discuss joint work with Inna Capdeboscq on constructing cocompact lattices in complete Kac-Moody groups which have building X . The lattices we obtain contain surface subgroups.