# Lattice commensurators in right-angled buildings

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When $G$ is a group and $\Gamma$ is a subgroup of $G$, recall that the *commensurator* of $\Gamma$ in $G$ is the set of all elements $g \in G$ so that $g\Gamma g^{-1}$ is commensurable to $\Gamma$, i.e. so that $\Gamma$ and $g\Gamma g^{-1}$ have a common finite index subgroup. In the Lie group setting, Margulis proved that a lattice is arithmetic if and only if its commensurator is dense. When $G$ is the automorphism group of a locally finite polyhedral complex $X$, *uniform lattices* in $G$ are subgroups which act cocompactly on $X$ with finite vertex stabilizers. If $X$ is a tree, results of Liu, Bass-Kulkarni, and Leighton show that the commensurator of every uniform lattice is dense in $G$. When $X$ is a right-angled building, we develop and use a technique of "unfolding" to construct new lattices, and then use these lattices together with coverings of and actions on complexes of groups to show that the commensurator of the "standard uniform lattice" is dense in $G$. (This density result was proved independently and using different techniques by F. Haglund.) This is joint work with Anne Thomas.