PATTERN COMPLEXITY IN CUT AND PROJECT SETS

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Cut and project sets are discrete point patterns. They are defined by a linear subspace E of a k-dimensional Euclidean space, together with an acceptance strip. The points in the pattern are given by first intersecting the integer lattice with the acceptance strip ("cut") and then projecting these intersection point to the supspace ("project"). Studying the point pattern obtained in this way connects in a natural way tilings theory to the toral rotation given by the subspace, and to the Diophantine properties of the linear form defining the subspace.

In the talk we take a look at these connections and give an overview of several recent results that build on these connections. The results characterize cut and project sets with different kinds of pattern complexity, namely, whether they are bounded distance from lattices (joint w/ Alan Haynes), how complicated is their frequency spectrum (joint w/ AH, Lorenzo Sadun and Jamie Walton), whether they are linearly repetitive (joint w/ AH and JW), and how fast their pattern repetitivity function typically grows (joint w/ AH, Antoine Julien and JW).