ABSTRACT:

A heap of pieces is a set of pieces that are stacked on top of one another, tetris style. We care about counting heaps of pieces because many interesting combinatorial questions, like the Cayley-Hamilton theorem, can be reduced to questions about counting heaps of pieces. In this talk, I will state and prove a counting lemma and use it to count some interesting examples. Then, I will show why the Cayley-Hamilton theorem is a combinatorial theorem that can be proved using heaps of pieces.