ABSTRACT:

Our bootstrap percolation model works as follows: start with ordinary percolation, that is, occupy each site independently with probability p, in a finite box of size L(p). Then iteratively occupy sites of which at least half of the neighborhood is occupied. Various neighborhoods have been investigated; we focus on anisotropic neighborhoods.

If we let p tend to 0 and L(p) tend to infinity, can we say which fraction of the box will eventually be occupied? It turns out there often is a sharp threshold Lth(p): if L increases faster than Lth, then eventually the whole box is occupied, but if L increases slower than Lth, then eventually the box is mostly empty.

This talk is on anisotropic bootstrap percolation in three dimensions.
We find that the order of the threshold is determined by the 'easiest growth direction' in the model. Contrary to anisotropic bootstrap percolation in two dimensions, in three dimensions the order of the threshold for anisotropic bootstrap percolation can be equal to that of isotropic bootstrap percolation.

Joint work with Aernout van Enter.

You are kindly invited.