RANDOM WALK ON THE HIGH-DIMENSIONAL LONG-RANGE IIC

TIM HULSHOF

Critical percolation clusters are known to be finite but large in high-dimensions. If we increase the percolation parameter to just above criticality, a single infinite cluster appears. The incipient infinite cluster (IIC) can be thought of as the infinite cluster as it is on the verge of appearing. The IIC locally looks like a critical cluster. In particular, the IIC has a self-similar structure. By studying random walk on a graph, we can study the geometry of that graph. Random walk on the IIC has been studied extensively in recent years. In my talk I will discuss a variant of percolation known as long-range percolation, where edges are present at all length-scales, but the probability of seeing an edge decays as a power-law in the length of the edge. Qualitatively, long-range percolation has all the same features as ordinary percolation, but the presence of very long edges alters the geometry of the percolation graph. In my talk I will discuss the differences and similarities between random walk behaviour and geometry of the long-range percolation IIC and of the ordinary IIC, and I will discuss evidence of a phase transition in the 'long-range parameter' that can explain this difference.

(Joint work with Remco van der Hofstad and Markus Heydenreich)