Last-passage percolation: particles, competition interfaces and geodesic trees.

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The last passage percolation model (LPP) is defined as follows. In each vertex of the Z^2 lattice put a positive continuous random variable called the weight of x. All the weights are independent. Consider paths between two ordered points (coordinate by coordinate) x and y in Z^2 that consist of sequences or vertices where the initial point is x and the last one is y, all adjacent vertices are neighbors, but also impose the condition that the path can only take up or right steps. The weight of each path is the sum of the weights of its vertices. The percolation function between two ordered points x and y is defined as the maximum of the weight running over all admissible paths and the geodesic between such points is the one which attains the maximal weight.

This model has received a lot of attention over the last decades since it is strongly related to classical models (like tandem queues) and it is also believed to be in the KPZ class, which means that, after time space scaling, its dynamics behaves as the famous Kandar-Paris-Zhang equation.

In this talk, we will examine the LPP and some results about it in recent years. We will see the relationship between the LPP and microscopic movement models, growing models and the forest generated by the maximal weight paths. By using such links, we will present some results concerning the finitude of the tree which has root at the origin.