The Diameter of Uniform Spanning Trees in High Dimensions

The uniform spanning tree (UST) of a finite connected graph G is the uniform measure over all spanning trees of G. I will present classical algorithms used to generate the UST and discuss some global properties (distance, diameter) of the UST of the complete graph on n vertices. I will then show that under very mild expansion assumptions on the base graph (on n vertices), the diameter of the UST is of order $\sqrt{n}$, as for the UST on the complete graph. In particular, this result holds for balanced expanders, tori of dimension at least 5, the hypercube and two cliques joined by a perfect matching.

Based on joint works with Noga Alon, Eleanor Archer, Peleg Michaeli and Asaf Nachmias.