Speaker: Federico Sau

Title: Mixing of the Averaging process and its discrete dual on finite-dimensional geometries

Abstract: Introduced by Aldous in a series of lectures and expository articles, the Averaging process is a Markovian mass redistribution model on a graph, roughly described as follows: each vertex is initially assigned a real-valued mass, and at exponential times pairs of neighboring vertices split their mass equally among them. The aim of this talk is to present some recent results on the mixing of a generalization of the Averaging process. Here, the process takes place on a growing sequence of graphs assumed to be "finite-dimensional", in the sense that the random walk on those geometries satisfies a family of Nash inequalities. As a byproduct of our analysis, we provide a complete picture of the total variation mixing of a discrete particle dual of the Averaging process displaying, in particular, a cutoff phenomenon in a low-density regime. Finally, we exploit the duality between the two processes to show that the dual satisfies a version of Aldous' spectral gap identity, namely, the relaxation time of the process is independent of the number of particles.

Based on a joint work with Matteo Quattropani (LUISS, Rome)