Analysis Seminar

On the geometry of particles in a branching Brownian motion

By

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Abstract: Branching Brownian motion (BBM) is a well-studied spatial population model in which particles evolve independently of each other, move according to Brownian motion in space, and branch at the end of their random lifetimes.
In this talk, we investigate the geometry of particles in a strictly dyadic BBM evolving in R^d, starting with a coarse picture and moving towards a finer picture. We first give a general description of the model of BBM, along with some well-known results on its total mass and speed, corresponding to a coarse picture. Then, we focus on the local mass of BBM, and review some classical results on the local mass as well as a recent large-deviations result on the probability that the local mass is atypically small.
Building on local mass analysis, we pass to a finer picture of the geometry of BBM. First, we study the density of BBM in the region where there is typically exponential growth of particles, and obtain asymptotic results on the covering radius and r(t)-enlargement of the support of BBM when r(t) is decaying exponentially in time t. Then, we consider the so-called branching Brownian sausage (BBM-sausage), which is defined as the random subset of R^d scooped out by moving balls with centers following the trajectories of the particles of a BBM, and study the
large-time asymptotic behavior of the volume of a shrinking BBM-sausage.

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Time: 13:30-14:30, GMT+3.
Place: ZOOM
To request the event link, please send a message to goncha@fen.bilkent.edu.tr