Matthias Kirchner

Title: Critical cluster cascades

Abstract: We consider a sequence of Poisson cluster point processes on $\mathbf{R}^d$: At step $n \in \mathbf{N}_0$ of the construction, the cluster centers have intensity $\frac{c}{n+1}$ for some $c > 0$, and each cluster consists of the particles of a branching random walk up to generation n-generated by a point process with mean 1. We show that this 'critical cluster cascade' converges weakly, and that either the limit point process equals the a.s. void process (extinction), or it has the same intensity c as the critical cluster cascade (persistence). We obtain persistence, if and only if the Palm version of the outgrown critical branching random walk is locally a.s. finite. This result allows us to give numerous examples for persistent critical cluster cascades. In this talk, we first illustrate the construction and the main result. Then, we discuss properties and possible applications of the limit point process in the persistent case.