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*A shape theorem for the convex hull of $d$-dimensional branching Brownian motion in periodic environments.*

We consider the long-time behaviour of a "heterogeneous" binary branching Brownian motion (BBM) in which the branching rate depends on where the branching event occurs. More precisely, for a positive function $g$, the instantaneous branching rate of a particle at location $x$ is characterized by $g(x)$ (we refer to this as $g$-BBM). When $g$ is periodic, we expect that the microscopic effects of $g$ average out on large scales, and the process should exhibit asymptotically homogeneous behaviour. Nevertheless, the heterogeneity of the branching rate introduces new technical challenges.

In this talk, I will prove a shape theorem for the convex hull of the $g$-BBM in all dimensions, namely that there exists a deterministic set $\mathcal{W}$ such that almost surely as $t \to \infty$, the convex hull of the $g$-BBM approximates $t\mathcal{W}$. This talk is based on joint work in progress with Louigi Addario-Berry (McGill) and Jessica Lin (McGill).