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A branching particle system as a model of FKPP fronts

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The FKPP equation is a common model in population dynamics, describing how a population spreads and grows over time and space, resulting in wave-like patterns.

Recent studies by Birzu, Hallatschek and Korolev on the noisy FKPP equation with Allee effects (or cooperation) suggest the existence of three classes of fluctuating wavefronts: pulled, semipushed and fully pushed fronts.

In this talk, I will introduce an analytically tractable model for fluctuating fronts, describing the internal mechanisms that drive the invasion of a habitat by a cooperating population. I will then use this model to explain how such mechanisms shape the genealogy of the population.

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