

A reaction–diffusion model for a population structured in phenotype and space

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In this talk, I will consider a nonlocal reaction-diffusion equation that models a population structured in space and in phenotype. Assume that the population lives in a heterogeneous environment, so that the same individual may be more or less fit according to its spatial position. I will give a criterion for persistence of the population, based on the principal eigenvalue of an elliptic operator. Next, I will give, in a particular case involving the Fisher Geometric Model, some optimisation results about the shape that the environment should take to make persistence as hard or as easy as possible.