Large time behaviour of the solution of a nonlinear diffusion problem in anthropology

by

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Abstract:
In this talk, we consider a reaction-diffusion model for the spread of farming in Europe that was occupied by hunter-gatherers; this process is known as the Neolithic agricultural revolution. The spread of farmers is modelled by a nonlinear porous medium type diffusion equation which coincides with the singular limit of another model for the dispersal of farmers as a small parameter tends to zero. From the ecological viewpoint, the nonlinear diffusion takes into account the population density pressure of the farmers on their dispersal. The interaction between farmers and hunter-gatherers is of the Lotka-Volterra prey-predator type. We show the existence of the global-in-time solution to the problem and study its asymptotic behaviour as time tends to infinity. This is joint work with Jan Elias and Masayasu Mimura.