Propagating terrace for semilinear diffusion equations

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In this talk I will discuss the behavior of spreading fronts in semilinear diffusion equations on the entire space. Here, by a "spreading front", I mean the expanding level sets of a solution that starts from compactly supported (or rapidly decaying) nonnegative initial data.

If the nonlinearity is multi-stable, the dynamics of a solution can no longer be described by a single front, but by what we call a "propagating terrace", which roughly means a layer of several fronts that expand to infinity at different speeds. I will first give a brief review of my ealier result for the one-dimensional case (joint work with Thomas Giletti and Arnaud Ducrot), in which the term "propagating terrace" was first introduced. I will then discuss the higher dimensional case, and show that every solution eventually behaves like what we call a "radially symmetric propagating terrance". This latter part is joint work with Yihong Du.