

Abstract: The main topic of this talk concerns the analysis of a particular phenomenon, known in literature as metastability, that some one-dimensional reaction-diffusion (R-D) equations exhibit. The term “metastability” is used in the analysis of partial differential equations to describe the persistence of unsteady structures for a very long time; metastable dynamics appears when some generic solutions of a time-dependent equation seem motionless while still evolving very slowly and then eventually, after a very long time, change dramatically and reach a stable configuration. The seminal example of PDE whose solutions exhibit metastability is the one-dimensional Allen-Cahn equation, where the linear diffusion term is coupled with a balance bistable reaction, that can be seen as the derivative of a double well potential. In this talk, we will review the main results obtained in the past years about several variants of the Allen-Cahn equation.