

Introduction to reaction-diffusion equations

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Reaction-diffusion equations abound in physics, ecology and biology. In this series of lectures, I will start by describing some of the motivations to introduce reaction-diffusion equations. I will then review their fundamental properties. Reaction-diffusion equations are non-linear parabolic partial differential equations and these lectures are also an introduction to this general topic. Travelling fronts play a particularly important role in the study of reaction-diffusion equations. I will discuss this class of solutions. Then, I will describe phenomena of propagation/extinction. Lastly, in the case of propagation, I will show how to determine the spreading speed and derive some qualitative properties of the expanding level sets. If time permits, I will also mention results for periodic non-homogenous environments.