DMat
Universidade de Aveiro

CIDMA
CENTRO DE I&D EM MATEMÁTICA E APLICAÇÕES
CENTER FOR R&D IN MATHEMATICS AND APPLICATIONS

SEMINAR

Grupo de Análise Funcional e Aplicações
Functional Analysis and Applications Group

Optimal control of propagation fronts and moving sets

Alberto Bressan

Department of Mathematics, Penn State University

Abstract

We consider a controlled reaction-diffusion equation, modeling the spreading of an invasive population. Our goal is to derive a simpler model, describing the controlled evolution of a contaminated set.
The first part of the talk will focus on the optimal control of 1-dimensional traveling wave profiles. Using Stokes' formula, explicit solutions are obtained, which in some cases require measure-valued optimal controls. In turn, this leads to a family of optimization problems for a moving set, related to the original parabolic problem via a sharp interface limit.
In connection with moving sets, in the second part of the talk I will present some results on controllability, existence of optimal strategies, and necessary conditions. Examples of explicit solutions and several open questions will be also discussed.
This is a joint research with Maria Teresa Chiri and Najmeh Salehi.

Room *11.2.23*
June 17, 2022 - 16:00

This seminar is supported in part by the Portuguese Foundation for Science and Technology (FCT - Fundação para a Ciência e a Tecnologia), through CIDMA - Center for Research and Development in Mathematics and Applications, within project UIDB/04106/2020.

FCT Fundação para a Ciência e a Tecnologia

REPÚBLICA PORTUGUESA