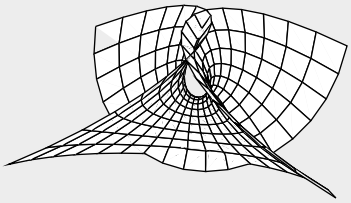

Oberseminar Mathematische Strömungsmechanik

Institut für Mathematik der Julius-Maximilians-Universität Würzburg

Enrique Zuazua

Friedrich-Alexander-Universität Erlangen-Nürnberg -
Alexander von Humboldt-Professorship

Control of reaction-diffusion models arising in Social and Biological Sciences

Abstract:

We analyze the dynamics, numerics and control of reaction-diffusion models arising in social and biological sciences. Frequently, in applications, their control plays an important role when avoiding population extinction or propagation of infectious diseases, enhancing multicultural features, etc. When addressing these issues one of the main challenges is that the solution, typically a proportion or a density function, needs to preserve given lower and upper bounds (taking values in $[0; 1]$)). Controlling the system to the desired final configuration then becomes complex, and sometimes even impossible.

In the present work, we analyse the controllability to constant steady-states under constraints and provide both positive results in long time horizons and exhibit also some barrier effects that may arise when the domains where the dynamics evolves is too large. For this to be done we combine the stability properties of the systems and the connectivity of the set of steady states. We will also present some numerical experiments showing the complexity of the optimal controlled dynamics.

This lecture is inspired by joint works with I. Mazari, C. Pouchol, D. Ruiz-Ballet, E. Trélat and Y. Zhu.

via Zoom video conference (request the Zoom link from klingen@mathematik.uni-wuerzburg.de)

Monday, July 6 at 9:30 am

Zu diesem Vortrag sind Sie herzlich eingeladen.

gez. Christian Klingenberg