

2020
chapter

ICMC SUMMER MEETING ON DIFFERENTIAL EQUATIONS

3-5 FEBRUARY 2020 | SÃO CARLOS, SP BRAZIL
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Celebrating the **60th**
birthday of

TOMÁS CARABALLO

SCIENTIFIC COMMITTEE

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Yingfei Yi (University of Alberta/Canada and JLU/China)

LIST OF SESSIONS

Elliptic Equations
Fluid Equations
Linear Equations
Evolution Equations and Applications
Integral and Functional Differential Equations
Boundary Perturbations of Domains for PDEs and Applications
Nonlinear Dynamical Systems
Dispersive Equations
Conservation Laws and Transport Equations
Poster Session



NONLINEAR DYNAMICAL SYSTEMS/EVOLUTION EQUATIONS AND APPLICATIONS

Organizer: Juliana Fernandes

Existence for Reaction-Diffusion Equations with almost-monotonic reaction terms

Alejandro Vidal-López, Aníbal Rodríguez-Bernal
Xi'an Jiaotong-Liverpool University

In this talk we present global existence and uniqueness results for reaction-diffusion equations in Lebesgue spaces with almost-monotonic nonlinearities, not fitting in the standard theory of local existence.

A local/nonlocal diffusion model

Bruna Cassol dos Santos, Sergio Muniz Oliva, Julio Daniel Rossi
University of São Paulo

In this work, we study some qualitative properties for an evolution problem that combines local and nonlocal diffusion operators acting in two different subdomains of $\Omega = (-1, 1)$. The local part is composed of a heat equation with Neumann/Robin type boundary condition and the Robin type boundary condition at $x = 0$ encodes the coupling with the nonlocal part of the problem. The energy functional associated with this evolution problem can be viewed as the gradient flow associated with this energy. We prove existence and uniqueness results, as well as, that the model preserves the total mass. We also study the asymptotic behavior of the solutions. In addition, rescaling the nonlocal kernel in a suitable way, we can recover the usual heat equation.

An average principle for stochastic differential equations

Fabiano Borges da Silva, Diego Sebastian Ledesma
UNESP

In this work we use the decomposition of stochastic flows to obtain components that represent the fast and slow motion of a solution flow of a given stochastic differential equation (SDE), which has a perturbation in a certain direction transversal to a foliation. And through a special metric, that works well with stochastic calculation tools, we obtain some estimates for the approximation between slow motion and the solution of a differential equation obtained using an average principle.

On the dynamics of a parabolic PDE driven by the p-Laplacian with indefinite logistic source

Gustavo F. Madeira, Tito L. M. Luna
UFSCar

We are concerned with existence, uniqueness and asymptotic behaviour of positive solutions of a parabolic PDE driven by the p-Laplacian with indefinite and unbounded potentials besides a logistic source having weight which is also indefinite and unbounded. The boundary condition appearing is of flux type, precisely, Neumann or Robin. The asymptotic stability properties of the stationary solutions are described using principal eigenvalues of some elliptic eigenvalue problems.