UNIVERSIDAD NACIONAL MAYOR DE SAN MARCOS

(Universidad del Perú: Decana de América)

Facultad de Ciencias Matemáticas

Grupos de Investigación EDOACBI &ECUKI

VII

JORNADA INTERNACIONAL DE ECUACIONES DIFERENCIALES Y APLICACIONES

"Dr. Raúl Moisés Izaguirre Maguiña - 2023"

Del 16 al 20 de octubre de 2023

Conferencias Magistrales (Presenciales y virtuales)
Mini Cursos - Iniciación Científica

CONFERENCISTAS E INVESTIGADORES

Internacionales y Nacionales

Dirigido a: Investigadores, Docentes de Ciencias Básicas e Ingenierías, alumnos de pre & posgrado y público en general.

Del 16 al 18 y 20 de octubre: Modalidad virtual. Google Meet & Zoom

El 19 de octubre: Modalidad presencial. Aula 301. FCM-UNMSM.

https://us06web.zoom.us/j/88643598291?pwd=zQBuuWBZEo7iioFaBdAvrur24hJgUL.1

CÓDIGO:
2KZE-23053114

PÁGINA WEB

- https://edoacbi.com/
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- **FORMULARIO DE INSCRIPCIÓN VII JIEDA 23:**
  https://docs.google.com/forms/d/e/1FAIpQLSeUb3sKvPdAdk4KisCMBNuIkbrHqlpPMeu9dnK9QAufHlrEvQ/viewform

Inscripción y Certificación

Inscripción gratuita.
Se emitirá certificado al participante que registre una asistencia por lo menos al 80% de las conferencias.

ORGANIZAN:

- Facultad de Ciencias Matemáticas.
- Grupos de Investigación EDOACBI & ECUKI.
- Centro de Responsabilidad Social y Extensión Universitaria.
- Vicedecanato de Investigación y Posgrado. FCM-UNMSM.
- Departamento Académico de Matemática. FCM-UNMSM.
- Escuela Profesional de Computación Científica. FCM-UNMSM.
- Escuela Profesional de Matemática. FCM-UNMSM.

AUSPICIADORES:

FCM-UNMSM

Instituto de Investigación FCM-UNMSM

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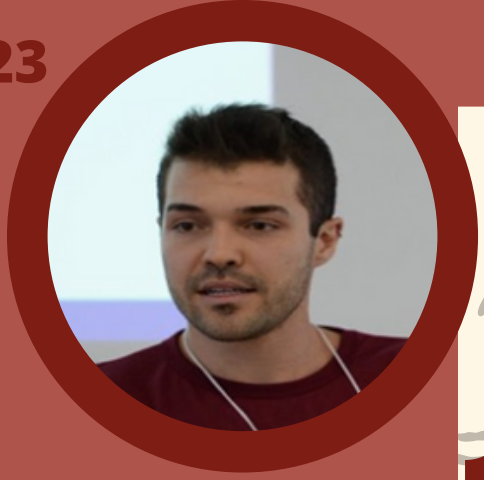
MINICURSO 01 - VIRTUAL. VII JIEDA23



MAYKEL BOLDRINI BELLUZI

- Nationality: Brazilian
- University: Universidade de São Paulo (USP-Brasil)

- Del martes 17 al jueves 19 de octubre
- Hora: 9:00 am – 10:45 am

REPRESENTATION OF GLOBAL ATTRACTORS FOR ONE-DIMENSIONAL REACTION-DIFFUSION EQUATIONS.

HTTPS://US06WEB.ZOOM.US/J/88643598291?PWD=ZQBUUWBZEO7IIOFABDAVRUR24HJGUL.1

Abstract: In this course we will build computer-aided representations for the global attractors of reaction-diffusion equations in one-dimension. Attractors are objects in a given space that significantly simplify the long-term dynamics of an evolution system. Knowing them is something extremely useful for a certain problem at hand, but there are few examples where it is possible to describe them precisely.

We will present tools that allow us to write the attractor for the one-dimensional reaction-diffusion problem as fixed points in space (known as equilibria) and connections between these points. We shall combine the existing theory on the subject with the use of computer programs to assist in this task. The course is aimed at a wide audience, not requiring much prior knowledge and it is thought for a 3-day course, approaching the following topics:

- Day 1 - Introduction to the scalar reaction-diffusion equation: Existence of Lyapunov function, global attractor and structure of the attractor given as equilibria and connections between them.
- Day 2- By using the Hamiltonian structure of the associated elliptic problem, we define the Time-map associated to the system and search for the equilibria for the equation.
- Day 3 - Once the equilibria are determined, nodal properties of those solutions are used to establish connections between them

Some of the references used to build this course are:

[1] Brunovsky, P., and Chow, S.-N. Generic properties of stationary state solutions of reaction-diffusion equations. J. Differential Equations 53, 1 (1984), 1-23.

[2] Fiedler, B., and Rocha, C. Heteroclinic orbits of semilinear parabolic equations. J. Differential Equations 125, 1 (1996), 239-281.

[3] Rocha, C. Realization of the Conley braids of planar hamiltonian systems. Journal of Dynamics and Differential Equations, 19(3):571-591, 2007.

MINICURSO 02 - VIRTUAL. VII JIEDA23

SANTIAGO MILLER
QUISPE MAMANI

- Nationality: Peruvian
- University: Universidad Nacional de Juliaca (UNAJ-Perú)
- Del martes 17 al jueves 19 de octubre
- Hora: 2:00 pm. - 3:45 pm

INTRODUCCIÓN A MÉTODOS VARIACIONALES

HTTPS://US06WEB.ZOOM.US/J/88643598291?PWD=ZQBUUWBZEO7IIOFABDAVRUR24HJGUL.1

Definiremos funcionales semicontinuos inferiormente y mostraremos algunas propiedades un sobre esta clase de funciones. También haremos una revisión sobre espacios de Sobolev y como aplicación de los resultados, mostraremos la existencia de solución para un problema elíptico sublineal.

Enunciaremos y demostraremos el Lema de Deformación, el cual es la principal herramienta para entender la demostración del Célebre Teorema del Paso de la Montaña de Ambrosseti y Rabinowitz con una aplicación a un problema superlineal.

References:

[1] Ambrosetti, A., Rabinowitz P. H. - Dual Variational Methods in Critical Point Theory and Applications, Journal of Functional Analysis 14 (1973) 349-381.
[2] Rabinowitz Paul H. - Minimax Methods in Critical Point Theory with Applications to Differential Equations, Conference Board of the Mathematical Sciences by the American Mathematical Society(1986).
[3] Costa, David G. - An Invitation to Variational Methods in Differential Equations, Birkh¨auser Boston, U.S.A. (2007).
[4] Willem, Michel - Minimax Theorems-Progress in Nonlinear Differential Equations and Their Applications, Birkh¨auser, Belgium (1996).

MINICURSO 03 - VIRTUAL. VII JIEDA23

JOÃO VITOR DA SILVA

- Nationality: Brazilian
- University: ·University: Universidade Estadual de Campinas (Unicap-Brasil)
- Del martes 17, jueves 19 y viernes 20 de octubre
- Hora: 9:00 a 10:45 am.

A TOUR BY ELLIPTIC REGULARITY THEORY AND FREE BOUNDARY PROBLEM

HTTPS://US05WEB.ZOOM.US/J/84681950142?PWD=VIQ2PE85BQFYKRR8SDX1QFWNNVVEZU.1

In these Lectures we will introduce modern studies related to the regularity theory for weak and viscosity solutions of second-order elliptic PDEs in divergent and non-divergent form. Among the points to be addressed, we deal with the equivalence of notions of solutions for harmonic profiles, Schauder theory for the Laplacian operator, regularity for fully non-linear models with double law of degeneracy and some classic free boundary problems from the literature, such as the obstacle problem and the dead core problem. At the end, we will take a brief tour of the theory of the Infinite-Laplacian operator, its regularity theories and open questions.

References:

[1] J.V. da Silva and Gleydson C. Ricarte, Regularidade elíptica e problemas de fronteiras livres, 34º Colóquio Brasileiro de Matemática - IMPA, 2023. ISBN 978-85-244-0533-4.

[2] X. Fernández-Real & X. Ros-Oton, Regularity Theory for Elliptic PDE. Book, EMS Zurich Lectures in Advanced Mathematics Volume: 28; 2022; 236 pp

[3] E.V. Teixeira, Um convite à análise geométrica de EDPs elípticas de 2a ordem. IV EBED, João Pessoa, 2011.

[4] L. Wang, Regularity Theory. Lecture Notes - Korea Winter School, 2013

[5] N. Wolanski, Introdução a los problemas de frontera libre.