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1) Eventos del 14 al 18 de marzo de 2022

Seminario de Matemática Aplicada

Título: Desigualdad de Harnack para ecuaciones fraccionarias elípticas en forma de no divergencia


Conferenciante: Pablo Raúl Stinga (Iowa State University)

Día: 15 de marzo de 2022

Hora: 11:00h

Lugar: Seminario Alberto Dou (aula 209), Fac. de CC Matemáticas, UCM y [Google Meet](#)

Organizado por: Instituto de Matemática Interdisciplinar (IMI) y el Departamento de Análisis Matemático y Matemática Aplicada



SEMINARIO DE MATEMÁTICA APLICADA

Pablo Raúl Stinga
Iowa State University

Desigualdad de Harnack para ecuaciones fraccionarias elípticas en forma de no divergencia

Las ecuaciones fraccionarias elípticas en forma de no divergencia aparecen en relación con las ecuaciones de Monge-Ampère fraccionarias, y en aplicaciones a claridad y financia. Presentamos la desigualdad de Harnack para soluciones no negativas de ecuaciones dadas por potencias fraccionarias de operadores elípticos en forma de no divergencia. Este es un trabajo conjunto con Henry Vaughan (UT Austin).

Organizado por el Instituto de Matemática Interdisciplinar (IMI) y el Departamento de Análisis Matemático y Matemática Aplicada

Fecha y hora: 15 de Marzo de 2022 a las 11:00h
Lugar: Seminario Alberto Dou (aula 209), Fac. de CC Matemáticas, UCM
Online: <https://meet.google.com/sde-qpnw-qxb>

Seminario de Matemática Aplicada

Title: Nonlocal Aggregation-Diffusion Equations: entropies, gradient flows, phase transitions and applications

Speaker: José Antonio Carrillo (University of Oxford)

Day: 16 de marzo de 2022

Hour: 11:00h

Place: Seminario Alberto Dou (aula 209), Fac. de CC Matemáticas, UCM y [Google Meet](#)

Organized by: Interdisciplinary Mathematics Institute (IMI) , Research Group MOMAT and Department of Applied Mathematics and Mathematical Analysis



SEMINARIO DE MATEMÁTICA APLICADA

Jose Antonio Carrillo
University of Oxford

Nonlocal Aggregation-Diffusion Equations: entropies, gradient flows, phase transitions and applications

This talk will be devoted to an overview of recent results understanding the bifurcation analysis of nonlinear Fokker-Planck equations arising in a variety of applications such as consensus formation, aggregation, granular media, tumouring behaviour, opinion dynamics and financial mathematics to name a few. We will present several results related to localised Cahn-Hilliard reaction-diffusion, McKendrick-Vlasov equations, and nonlinear diffusion Keller-Segel type models in several settings. We will also discuss the existence of solutions in discontinuous phase transitions on the torus under suitable assumptions on the Fourier modes of the interaction potential. The content is based on recent work in the right functional space associated to the stability of the problem at hand. While in the case of linear diffusion, one can work in the L^2 framework, nonlinear diffusion needs the stronger (and topology) to proceed with the analysis based on Csiszar-Kullback-Leibler relative entropy applied to the variation of the entropy functional. Explicit examples show that the global bifurcation transition can be very complicated. Stability of the solutions will be discussed based on numerical simulations with fully explicit energy decay/lyapunov exponents (whereas stability) related to the gradient flow structure of these problems. The theoretical analysis of the asymptotic stability of the diffusion-limited solutions is a challenging open problem. This overview talk is based on several works in collaboration with B. Balle, A. Bertone, J. A. Carrillo, L. Chen, F. Di Francesco, B. Goffard, J. Hu, G. Engelberg, A. Schott, G. Wang, J. Wang, and L. Zhang. This research has been funded by EPSRC EP/R013887/1 and ERC Advanced Grant H2020-885330.

Organized by Interdisciplinary Mathematics Institute (IMI) , Research Group MOMAT and Department of Applied Mathematics and Mathematical Analysis

Date and hour: 16 March 2022, 11:00h
Place: Seminario Alberto Dou (aula 209), Fac. de CC Matemáticas, UCM
Online: <https://meet.google.com/sde-qpnw-qxb>

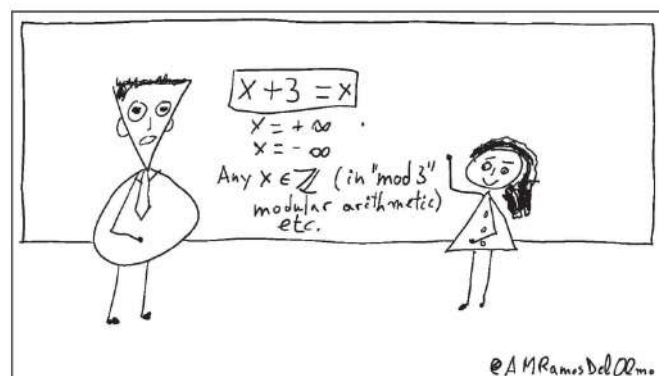
2) Nuevas publicaciones

R. Campoamor-Stursberg. Lie-symmetry analysis of the Painlevé-Gambier classification of second-order scalar ordinary differential equations. In *Advances in Mathematics Research*. 2021, 29, 77 - 131. ISBN: 978-1-53619-759-4. [Link](#).

P. J. Chocano, **M. A. Morón**, **F. R. Ruiz del Portal**. Computational approximations of compact metric spaces. *Physica D: Nonlinear Phenomena*. 2022, 433, Article number 133168.
<https://doi.org/10.1016/j.physd.2022.133168>

J. Fernández-Sánchez, S. Maghsoudi, **D. L. Rodríguez-Vidanes**, **J. B. Seoane-Sepúlveda**. Classical vs. non-Archimedean analysis: an approach via algebraic genericity. *Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales - Serie A: Matemáticas*. 2022, 116, 2, Article number 72.
<https://doi.org/10.1007/s13398-022-01209-5>

3) La viñeta matemática



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