

La Escuela de Investigación Lluís Santaló de la RSME celebrará su edición de 2018, del 13 al 17 de agosto, en la sede de Santander de la Universidad Internacional Menéndez-Pelayo. Está dirigida por los profesores José A. Cañizo (Universidad de Granada) y José A. Carrillo (Imperial College London, UK). El título de la escuela es **"Interactions between PDE and probability"** y está especialmente recomendada para estudiantes graduados y jóvenes investigadores

Se impartirán los siguientes cursos:

Eric Carlen (Rutgers University, US): *From stochastic models of many-particle systems to PDE descriptions of transport.*

Martin Hairer (Imperial College London, UK): *The BPHZ theorem for stochastic PDEs.*

Benoît Perthame (Université Pierre et Marie Curie, France): *PDEs for neural networks: analysis, simulations and behaviour.*

Dejan Slepcev (Carnegie Mellon University, US): *Discrete variational problems in random settings and their continuum limits.*

Angela Stevens (Universität Münster, Alemania): *Partial differential equations and interacting stochastic many-particle models for self-attraction and self-organization in biology.*

Además de los cursos, el programa se completa con 6 charlas a cargo de **Matteo Bonforte**, **Stephen Luckhaus**, **Xue-Mei Li**, **Barbara Niethammer**, **Grigorios Pavliotis** y **Juan Luis Vázquez**.

The *Lluís Santaló Summer School on "Interactions between PDE and probability"* will take place at Palacio de la Magdalena in Santander, Spain, from 13 to 17 August 2018 (map here). It is part of the summer courses at the Universidad Internacional Menéndez Pelayo, and it is co-funded by the Real Sociedad Matemática Española (RSME) and Universidad Internacional Menéndez Pelayo (UIMP).

The course series is named after the Spanish mathematician Lluís Antoni Santaló Sors.

In the recent years a fruitful interaction has taken place between probability, functional inequalities and nonlinear partial differential equations (PDEs). Among others, there have been advances in entropy/entropy production inequalities for nonlinear aggregation-diffusion equations and transport inequalities and their links to the probability distribution of Fokker-Planck models. Some examples of current interest are the applications of variants of the Hardy-Littlewood-Sobolev inequality to understand Keller-Segel-type models and of Doeblin/Harris methods in integral kinetic equations. On the other hand, the analysis of stochastic interacting particle systems, stochastic PDEs and related relevant questions such as mean-field limits and phase transitions is booming; in particular due to the important applications in life-sciences. This summer school proposes five courses which give an advanced introduction to these topics and their applications in life sciences models, and six talks that present current related research problems.

<http://canizo.org/Santander2018>

www.uimp.es

INFORMACIÓN GENERAL

→ **Hasta el 15 de junio de 2018**

Santander
Campus de Las Llamas
Avda. de los Castros, 42
39005 Santander
Tel. 942 29 87 00 / 942 29 87 10
informacion@sa.uimp.es

Madrid
C/ Isaac Peral, 23
28040 Madrid
Tel. 91 592 06 31 / 91 592 06 33
alumnos@uimp.es

Horario
de 9.00 a 14.00 h
de 16.00 a 18.00 h (excepto viernes)

PLAZOS

→ **Plazo de solicitud de becas**
Hasta el día 28 de mayo, para los cursos que comiencen antes del 6 de julio de 2018

Hasta el día 15 de junio, para los cursos que comiencen a partir del día 9 de julio de 2018



→ **A partir del 18 de junio de 2018**

Santander
Palacio de la Magdalena
39005 Santander
Tel. 942 29 88 00 / 942 29 88 10

Horario
de 9.00 a 14.00 h
de 16.00 a 18.00 h (excepto viernes)

→ **Apertura de matrícula**
Desde el 8 de mayo de 2018
(Plazas limitadas)

→ Código 63U5 | Tarifa: C | ECTS: 1

Portada: basada en el original de Hugo Fontela para la UIMP, 2018

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UIMP Universidad Internacional
Menéndez Pelayo

Santander 2018

XIX School of Mathematics «Lluís Santaló»

Del 13 al 17 de agosto



Interactions between PDE and probability

José Antonio Carrillo de la Plata
José Alfredo Cañizo Rincón

Organizado en colaboración con



www.uimp.es

041-18-002-0

XIX SCHOOL OF MATHEMATICS «LLUIS SANTALÓ»
Interactions between PDE and probability

Dirección

José Antonio Carrillo de la Plata

Full Professor

Department of Mathematics

Imperial College London

José Alfredo Cañizo Rincón

Departamento de Matemática Aplicada

Universidad de Granada

Del 13 al 17 de agosto de 2018

Lunes 13

09.00 h | The single neuron: slow-fast dynamics

[Benoît Perthame](#)

Sorbonne-Universite, Campus Pierre et Marie Curie

10.00 h | The Integrate-and-Fire model, role of noise

[Benoît Perthame](#)

11.30 h | Self-similarity in Smoluchowski's coagulation equation

[Barbara Niethammer](#)

Universidad de Bonn

12.30 h | Conferencia

[Grigorios Pavliotis](#)

Imperial College London

15.00 h | Discrete variational problems in random settings and their continuum limits (I)

[Dejan Slepcevic](#)

Professor Department of Mathematical Sciences,
Carnegie Mellon University

16.00 h | Discrete variational problems in random settings and their continuum limits (II)

[Dejan Slepcevic](#)

Martes 14

09.00 h | Discrete variational problems in random settings and their continuum limits (III)

[Dejan Slepcevic](#)

10.00 h | Discrete variational problems in random settings and their continuum limits (IV)

[Dejan Slepcevic](#)

11.30 h | The BPHZ theorem for stochastic PDEs (I)

[Martin Hairer](#)

Imperial College London

12.30 h | The BPHZ theorem for stochastic PDEs (II)

[Martin Hairer](#)

15.00 h | Analysis of the Integrate & Fire model

[Benoît Perthame](#)

16.00 h | Time elapsed models

[Benoît Perthame](#)

17.00 h | Sesión de posters

[Matteo Bonforte](#)

Universidad Autónoma de Madrid

[Eric Carlen](#)

Rutgers University

[Martin Hairer](#)

[Xue-Mei Li](#)

Imperial College London

[Barbara Niethammer](#)

[Juan Luis Vázquez](#)

Catedrático de Matemática Aplicada

Universidad Autónoma de Madrid

Miércoles 15

09.00 h | The BPHZ theorem for stochastic PDEs (III)

[Martin Hairer](#)

10.00 h | The BPHZ theorem for stochastic PDEs (IV)

[Martin Hairer](#)

11.30 h | Hessian estimates for Schrodinger equations

[Xue-Mei Li](#)

12.30 h | Degenerate Fractional Diffusion Equations. A review

[Juan Luis Vázquez](#)

Jueves 16

09.00 h | From stochastic models of many-particle systems to PDE descriptions of transport (I)

10.00 h | From stochastic models of many-particle systems to PDE descriptions of transport (II)

11.30 h | Conferencia

[Matteo Bonforte](#)

12.30 h | Dislocations as finite size singularities and rigidity estimates

[Stephen Luckhaus](#)

University of Leipzig, Institute for Mathematics

15.00 h | Partial differential equations and interacting stochastic many-particle models for self-attraction and self-organization in biology (I)

[Angela Stevens](#)

University of Münster, Applied Mathematics

16.00 h | Moderately interacting stochastic many particle systems

[Angela Stevens](#)

17.00 h | Open problems at the interface between PDEs & probability

[Matteo Bonforte](#)

[Xue-Mei Li](#)

[Martin Hairer](#)

[Grigorios Pavliotis](#)

[Benoît Perthame](#)

[Dejan Slepcevic](#)

[Juan Luis Vázquez](#)

Moderación

[José Alfredo Cañizo Rincón](#)

Viernes 17

09.00 h | A PDE-ODE system and its connection to reinforced random walks

[Angela Stevens](#)

10.00 h | A hydrodynamic limit for chemotaxis in heterogeneous environments

[Angela Stevens](#)

11.30 h | From stochastic models of many-particle systems to PDE descriptions of transport (III)

12.30 h | From stochastic models of many-particle systems to PDE descriptions of transport (IV)