



Cursos de Verano 2022

SANTANDER



ESCUELAS

XXI «Lluís Santaló» Summer School. Random and Deterministic Point Configurations

Del 11 al 15 de julio

ORGANIZERS

Carlos Beltrán Álvarez

Universidad de Cantabria, Spain

SECRETARÍA

Jordi Marzo Sánchez

Universitat de Barcelona, Spain

Ciencia y Tecnología

ESCUELAS

Which is the “best” way to distribute a given number of points in the surface of a sphere or another geometrical object? For example, how can we choose points that are well-separated, or that provide good choices for integration or interpolation processes? Or that, thinking on the points as negatively charged particles, have a small value of the electrostatic potential?

These questions have given rise to a series of deep and fruitful problems in mathematics, ranging from the classical Thomson problem, proposed by Sir Joseph John Thomson in 1903, to “Smale’s 7th problem” proposed by Stephen Smale in his celebrated list of Problems for the XXI Century. From Tammes problem, proposed by Pieter Merkus Lambertus Tammes (a Dutch botanist studying the distribution of exit places in pollen grains) in the 1930’s to Maryna Viazovska’s breakthrough in the generalization of Kepler’s conjecture, to name just a few.

This school will provide students with the tools to understand the history, the applications, the state of the art and the beauty of some of these challenging mathematical problems. It will be accessible to general mathematicians and also show some of the last developments in the field by young researchers.

Código 6547– Tarifa C – 1 ECTS Organizado con:



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Solicitud Online

Para cualquier incidencia técnica con la solicitud puede enviar un correo electrónico a: **cau@uimp.es**



Plazos

Solicitud de becas

- Hasta el día 3 de mayo

Apertura de matrícula

- Desde el 20 de abril de 2022 (plazas limitadas)

Contacto

- De 9:00 a 14:00 h.
- De 16:00 a 18:00 h. (excepto viernes)

Hasta el 17 de junio

SANTANDER

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Avda. de los Castros, 42
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A partir del 20 de junio

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Monday 11th

9.30 Welcome

Carlos Beltrán Álvarez

10.00 Course 1: Points on spheres: discrepancy, energy, and beyond

Dmitriy Bilyk

Minnesota University, USA

11.00 Course 2: Introduction to determinantal point processes

Mylène Maïda

Université de Lille, France

12.30 Course 3: Fekete points, an overview

Joaquim Ortega-Cerdà

Universitat de Barcelona, Spain

13.30 Gaussian-like distributions and sums of squares

Khazhgali Kozhasov

Technische Universität Braunschweig, Germany

The Grid Method in Numerical Real Algebraic Geometry

Josué Tonelli-Cueto

Inria Paris & IMJ-PRG, Francia

14.00 Lower bounds for the energy on the sphere

Fátima Lizarte

Universidad de Cantabria, Spain

Minimizing the Green energy on the real projective plane 5.3

Pedro R. López-Gómez

Universidad de Cantabria, Spain

15.30 Exact semidefinite programming bounds for packing problems

María Dostert

KTH, Switzerland

16.30 Directional discrepancy on restricted intervals and Cantor sets

Michele Matrianni

Minnesota University, USA

On Complexity of Bezout's

Ernesto García Ciganda

Universidad de la República, Uruguay

Tuesday 12th

9.30 Course 1: Points on spheres: discrepancy, energy, and beyond.

Dmitriy Bilyk

10.30 Course 2: Introduction to determinantal point processes

Mylène Maïda

12.00 Course 3: Fekete points, an overview

Joaquim Ortega-Cerdà

13.00 The Spherical Cap Discrepancy of HEALPix Points

Damir Ferizovic

KU Leuven, Belgium

13.30 Non-universal fluctuations of the empirical measure for time dependent spherical random fields

Maurizia Rossi

Università degli Studi di Milano, Italy

13.00 Course 4: Reproducing kernels and determinantal point processes: completeness and minimality

Alexander Bufetov

Centre National de la Recherche Scientifique, France

Wednesday 13th

9.30 Course 1: Points on spheres: discrepancy, energy, and beyond.

Dmitriy Bilyk

10.30 Course 2: Introduction to determinantal point processes

Mylène Maïda

12.00 Course 3: Fekete points, an overview

Joaquim Ortega-Cerdà

13.00 Course 4: Reproducing kernels and determinantal point processes: completeness and minimality

Alexander Bufetov

15.30 Random Weierstrass Zeta-functions

Oren Yakir

Tel Aviv University, Israel

Elliptic Fekete points by optimizing the Bombieri-Weyl norm

Matías Valdés Dini

Universidad de la República, Uruguay

Thursday 14th

9.30 Course 1: Points on spheres: discrepancy, energy, and beyond.

Dmitriy Bilyk

10.30 Course 2: Introduction to determinantal point processes

Mylène Maïda

12.00 Course 3: Fekete points, an overview

Joaquim Ortega-Cerdà

13.00 Course 4: Reproducing kernels and determinantal point processes: completeness and minimality

Alexander Bufetov

14.00 Least-euclidean distortion embeddings of flat tori

Arne Heimendahl

Universität zu Köln, Germany

Asymptotically optimal cubature formulas on manifolds

Bianca Maria Gariboldi

Università degli Studi di Milano, Italy

The kissing number problem for regular tetrahedra

Andreas Spomer

Universität zu Köln, Germany

15.30 t-desings and cubature formulas: asymptotic bounds on the number of points

Ujué Etayo Rodríguez

Universidad de Cantabria, Spain

16.30 Outliers in weakly confined Coulomb-type systems

Alon Nishry

Tel Aviv University, Israel

Friday 15th

9.30 Course 1: Points on spheres: discrepancy, energy, and beyond.

Dmitriy Bilyk

10.30 Course 2: Introduction to determinantal point processes

Mylène Maïda

12.00 Course 3: Fekete points, an overview

Joaquim Ortega-Cerdà

13.00 Course 4: Reproducing kernels and determinantal point processes: completeness and minimality

Alexander Bufetov

14.00 Least-euclidean distortion embeddings of flat tori

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The kissing number problem for regular tetrahedra

Andreas Spomer

14.00 Closing



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