



## **Thematic Research Programme**

## Current Trends in Geometric Methods in Natural Sciences

2 September - 20 December 2019 ICMAT, Madrid www.icmat.es/RT/2019/CTIGMINS/

## Seminar

## RANDOM MATCHING PROBLEMS: COMBINATORICS, GEOMETRY AND DISORDER

SPEAKER: Gabriele Sicuro (Università di Roma la Sapienza)

DATE: Tuesday, 5 November 2019 - 14:30

VENUE: Departamento de Física Teórica II, Universidad Complutense de Madrid

**ABSTRACT:** Matching problems are combinatorial optimization problems traditionally considered in the realm of computer science and combinatorics. However, when, instead of a given instance of an optimization problem, a whole class of problems is considered, according to a suitable probability distribution, methods, ideas, and tools that physicists have developed in the context of statistical mechanics of systems with frustration and disorder can be applied and have been shown to be very effective. In this talk, I will review some old and recent results both for infinite-dimensional models and for matching problems in the Euclidean space. The latter case, in particular, is deeply related to the theory of Optimal transportation and the average properties of the solution strongly depend on the geometry of the considered domain. I will finally discuss some open problems currently under investigation.

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