

# General Mathematics Seminar

---

## of the University of Luxembourg

---

in cooperation with the  
Luxembourg Mathematical Society

Tuesday 8 December, at 4 pm

Campus Kirchberg, Room B02

**Prof. Dr. Thierry Lévy**

Université Pierre et Marie Curie (Paris 6), France

*Squares of determinants and probability*

*Abstract is available on next page.*

Coordinator: Stéphane Korvers  
RMATH contact: Anton Thalmaier

## Squares of determinants and probability

Thierry Lévy – UPMC (Paris 6)

A *point process* is a random finite subset of a set. The set of times at which an atom disintegrates in a sample of radioactive material, the set of places on Earth where someone stands at a certain moment, the set of locations of the trunks of the trees in a forest, are real-life examples of point processes.

Among many others, the class of *determinantal* point processes has received an ever increasing attention over the last 15 years. One of the main qualitative features of these processes is that their points tend to repulse each other, as for example the trees in a forest.

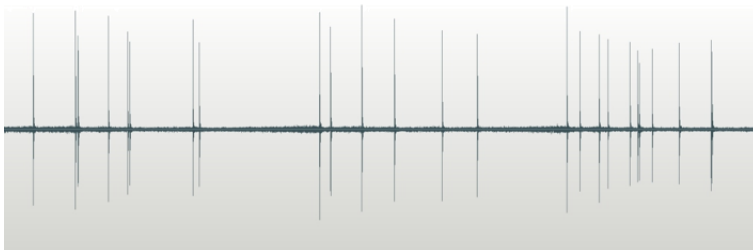
In this talk, I will explain what (the simplest kind of) determinantal point processes are, and give a number of examples of mathematical situations in which they arise.

The talk will start with elementary considerations of Euclidean geometry and a discussion of the Cauchy-Binet formula. Then, we will see determinantal point processes appear in relation with functions, matrices, graphs, and even possibly with one of the millenium problems.

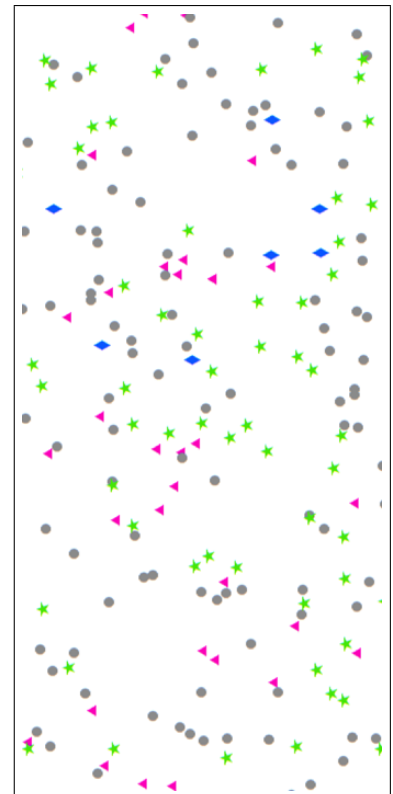
This talk should be accessible to graduate students.



Public lighting on Earth



Clicks of a Geiger counter near a sample of thorite



Trees in a forest of Oregon