# PLANNING BÉZOUT DOCTORAL DAY

## PROGRAMME

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| **09:45 - 10:15** | Petit-déjeuner |
| **10:15 - 10:45** | Présentation de la journée, de la fédération Bézout et du Graduate Program |
| **10:45 - 11:15** | Présentation par **Hëloise Gachet** |
| **11:15 - 11:45** | Présentation par **Ludovic Schwob** |
| **11:45 - 12:15** | Présentation par **Adrienne Le Meur** |
| **12:15 - 13:30** | *Repas du midi* |
| **13:30 - 14:00** | Présentation par **Mikhail Mironov** |
| **14:00 - 14:30** | Présentation par **Vincent Boulard** |
| **14:30 - 15:00** | Présentation par **Théo Dumont** |
| **15:00 - 15:30** | *Pause café* |
| **15:30 - 18:00** | Team Building |
| **19:00** | Restaurant *Chez Funda - Le village* |

## TITRES ET RÉSUMÉS

**Hëloise Gachet** — *Balanced assignments of periodic tasks*
We define and address the problem of balanced assignment of periodic tasks to indistinguishable workers, i.e., so that each worker performs every task with the same frequency over the long term. With the sole constraint is that no worker performs two tasks simultaneously, a necessary and sufficient condition of existence of a balanced assignment is established, along with periodicity and complexity results. For an extended version, additional constraints can be introduced, such as limits on the total number of working hours per week. In this setting, we have that whenever a balanced assignment exists, a periodic balanced assignment exists as well. To prove this, we introduce a problem of pebbles moving along arcs of an arc-colored Eulerian digraph, with strong links to Cayley graphs.

**Ludovic Schwob** — *Combinatoire des treillis distributifs*

**Adrienne Le Meur** — *Quantitative propagation of chaos for particle systems with memory and their long-time behaviour*
We study a class of interacting diffusion particle systems with memory and their mean-field limit. We first establish quantitative propagation of chaos estimates for this class of models. Our first main result is a uniform-in-time propagation of chaos estimate. We also investigate the long-time behaviour of the limiting nonlinear dynamics. As a consequence, our second main result is that the particle system converges asymptotically to the same equilibrium up to the propagation of chaos error, which shows that the large-particle limit and the large-time limit are exchangeable.

**Mikhail Mironov** — *Time-Frequency Analysis and Analytic Function Spaces*
Time-frequency analysis studies representations of functions using simultaneous localization in time and frequency. In this talk, I will introduce the basic ideas of a type of time-frequency analysis known as Gabor analysis. I will explain how Gaussian Gabor transforms naturally lead to spaces of analytic functions through the Bargmann transform. This correspondence connects problems about Gabor systems with questions of sampling and interpolation in analytic function spaces. I will discuss density phenomena and conclude with the Balian-Low principle, which illustrates a fundamental obstruction to time-frequency representations.

**Vincent Boulard** — *Geometric barriers for observability of heat semigroups on metric measure spaces*
We answer a long-standing open question posed by Ervedoza and Zuazua concerning a geometric bound on the exponential rate in infinite time integrated observability inequalities for heat equations. Our work establishes this geometric bound in a general geometric setting encompassing a wide variety of operators, including hypoelliptic Laplacians on sub-Riemannian manifolds. The result follows from a unified framework combining finite-speed propagation principles, local spectral asymptotics, and ultracontractivity estimates, providing a comprehensive understanding of sharp observability across diverse geometric contexts.

**Théo Dumont** — *Transport optimal : introduction et flots de gradient contraints / Optimal transport: introduction and constrained gradient flows*