# Journée dynamique Exeter-Saclay
# Laboratoire de Mathématiques d'Orsay, 17 juin 2026

## Programme

Tous les exposés sont en anglais. Ils ont lieu le **mercredi 17 juin 2026** en **salle 3L8** de l'Institut de Mathématique d'Orsay.

- **9h15-10h15** : Jean-René Chazottes (CPhT, Polytechnique), *Concentration inequalities and finitary codings.*
- **10h45-11h45** : Pierre-Antoine Guihéneuf (IMJ-PRG, Sorbonne Université), *Historical behaviour vs. physical measures for irrational flows on the torus with two stopping points.*
- **11h45-13h30** : Repas au CESFO.
- **13h30-14h30** : Tanja Schindler (University of Exeter, Jagiellonian University), *Trimmed sums, extravagances and extreme historic behaviour.*
- **15h-16h** : Charles Fougeron (LAGA, Université Paris-Nord), *Multidimensional continued fractions as win–lose inductions.*

## Repas

Le repas du midi aura lieu au CESFO. Le repas sera offert aux membres extérieurs au laboratoire dans la limite des fonds disponibles ; envoyez un e-mail à *damien.thomine@universite-paris-saclay.fr* pour en informer l'organisateur si vous souhaitez en bénéficier.

## Résumés

**Jean-René Chazottes** (CPhT, École Polytechnique) : *Concentration inequalities and finitary codings*

I will first recall what these inequalities are in the context of dynamical systems, focusing in particular on the Gaussian bound, what they imply (mixing, multiple mixing, etc.), as well as various applications to observables that are not ergodic sums (for example, the distance between the empirical measure and the "true" invariant measure).

In a second part, I will explain why a random process – or, equivalently, a shift-invariant measure on a product space – that is a finitary coding of an i.i.d. process (i.e., of a product measure) satisfies a Gaussian concentration bound whenever the coding radius has finite second moment.

This is recent joint work with S. Gallo and D. Takahashi, which actually extends to random fields and has implications for classical models of statistical mechanics, such as the Ising model or the Potts model.

*Mercredi 17 juin, 9h15-10h15, Salle 3L8.*

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**Pierre-Antoine Guihéneuf** (IMJ-PRG, Sorbonne Université) : *Historical behaviour vs. physical measures for irrational flows on the torus with two stopping points*

I will talk about an (old) joint work with Martin Andersson about irrational torus flows with two stopping points. A straightforward computation shows that if the stopping points are of generic type, then the set of empirical measures associated to any point is included in the set of convex combinations of the Diracs on the two fixed points (this set is a segment). We show with Martin that depending on Diophantine conditions on the slope of the flow and the relative positions of the fixed points, this set will be a.e. a single point or a nontrivial segment.

*Mercredi 17 juin, 10h45-11h45, Salle 3L8.*

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**Tanja Schindler** (University of Exeter, Jagiellonian University) : *Trimmed sums, extravagances and extreme historic behaviour*

We consider an irrational rotation $R_\alpha$ on the torus ($R_\alpha(x) = x+\alpha \bmod 1$) and the non-integrable observable $f(x) = \frac{1}{x} - \frac{1}{1-x}$ and study the Birkhoff sum $S_n = f + ... + f(R_\alpha^{n-1})$. As by Aaronson's theorem it is not possible to obtain strong convergence for $S_n/d_n$ where $d_n$ is any norming sequence, we look at the trimmed sum where we delete one or more of the maximal terms to obtain strong convergence. Depending on the Diophantine properties of $\alpha$ we may need to delete only one or many of the maximal entires of the Birkhoff sum to obtain strong convergence. Moreover, we look at extravagance, i.e. the limsup behaviour of $f(R_\alpha^n)/S_n$ and show under which conditions it equals $\infty$ or 0.

These results have consequences in studying a reparametrization $(T_t)$ of the linear flow $(L_t)$ with direction $(1, \alpha)$ on the two torus $\mathbb{T}^2$ with function $\varphi$, where $\varphi$ is a smooth non-negative function that has exactly two (non-degenerate) zeros at $p$ and $q$. We prove that for a full measure set $(\alpha, p, q) \in \mathbb{T} \times \mathbb{T}^2 \times \mathbb{T}^2$ the special flow $(T_t)$ exhibits extreme historic behavior proving a conjecture given by Andersson and Guihéneuf.

The talk is based on joint work with Max Auer and with Adam Kanigowski.

*Mercredi 17 juin, 13h30-14h30, Salle 3L8.*

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**Charles Fougeron** (LAGA, Université Paris-Nord) : *Multidimensional continued fractions as win–lose inductions*

For real numbers, the continued fraction expansion arises from the dynamics of the Gauss map and encodes precise information on Diophantine approximation. Ergodic properties of the Gauss map therefore translate into deep arithmetic consequences.

Multidimensional continued fractions (MCFs) aim to extend this correspondence to the approximation of vectors in $\mathbb{R}^d$ by rationals with a common denominator. Many algorithms have been introduced for this purpose, but no single model has emerged as canonical.

Several frameworks have been developed to study MCF algorithms from a unified perspective. In particular, simplex-splitting algorithms, initiated by Lagarias, describe the dynamics through locally projective linear maps acting on simplices. On the other hand, ideas originating in the study of measured foliations and interval exchange transformations led Kerckhoff and later Nogueira–Chaika to generalized Rauzy–Veech type inductions, where the dynamics act on a simplex together with the vertices of a graph through elementary binary splittings.

In this talk, I will introduce a common formalism encompassing both approaches. To every labeled graph we associate a deterministic dynamical system, called a *win–lose induction*. I will explain how classical multidimensional continued fraction algorithms fit naturally into this framework.

I will then present recent results giving a graph-theoretic criterion for ergodicity of win–lose inductions, a condition satisfied by the classical examples. These results also yield exponential tail estimates and spectral gap properties, leading in particular to uniqueness of the measure of maximal entropy and central limit theorems for multidimensional continued fraction algorithms.

*Mercredi 17 juin, 15h-16h, Salle 3L8.*