Journées MaDeF Grenoble 2026

University of Grenoble-Alpes,
June 18-19, 2026
organised by Adeline Leclerq-Samson (adeline.leclercq-samson@univ-grenoble-alpes.fr) and
Fabien Pazuki (fpazuki@math.ku.dk),
with the support of the CNRS (France),
of the Laboratoire Jean Kuntzmann, Université Grenoble-Alpes (France),
of the University of Copenhagen (Denmark).

Program

	Thursday 18.06	Friday 19.06
09:00-09:15	*Introduction*	
09:15-09:45	**Rasmus Waagpetersen**	**Francesco Campagna**
09:45-10:15	**Frédéric Lavancier**	**Olivier Wintenberger**
10:15-10:30	*Coffee break*	*Coffee break*
10:30-12:00	***Research***	***Research***
12:00-14:00	*Lunch*	*Lunch*
14:00-14:30	**Susanne Ditlevsen**	**Discussion MaDeF**
14:30-15:00	**Rémi Molinier**	
15:00-15:15	*Coffee break*	*Coffee break*
15:15-18:00	***Research***	***Research***
19:30	*Conference dinner*	

Titles and abstracts

Time: Thursday 18/06, 09:15–09:45.
Room: Room 1 at IMAG.
Speaker: **Rasmus Waagpetersen** (Aalborg).
Title: *K-functions for point processes on topographic surfaces.*
Abstract: Planar point pattern data are often analyzed using the so-called K-function. A point pattern is considered a realization of a point process, and the K-function essentially estimates for any distance r, the expected number of neighboring points within distance r of a typical point in the point process. Planar point patterns frequently arise as projections of point patterns on a surface in three dimensional space. For example, when assessing spatial patterns of trees, it is often ignored that the trees exists in a possibly complex topography and only the spatial x and y coordinates are considered. This may lead to detection of spurious clustering

when the standard K-function is used to investigate the pattern of two-dimensional tree locations obtained by projecting three-dimensional locations onto the plane. In this talk we will discuss different approaches to constructing surface aware K-functions for general surfaces and their advantages and limitations in terms of interpretation and computational feasibility.

TIME: Thursday 18/06, 09:45–10:15.
ROOM: Room 1 at IMAG.
SPEAKER: **Frédéric Lavancier** (Nantes).
TITLE: *Non parametric intensity estimation of spatial point processes by random forests.*
ABSTRACT: We propose a random forest estimator for the intensity of spatial point processes, applicable with or without covariates. It retains the well-known advantages of a random forest approach, including the ability to handle a large number of covariates, out-of-bag cross-validation, and variable importance assessment. Importantly, even in the absence of covariates, it requires no border correction and adapts naturally to irregularly shaped domains and manifolds. Consistency and convergence rates are established under various asymptotic regimes, revealing the benefit of using covariates when available. Numerical experiments illustrate the methodology and demonstrate that it performs competitively with state-of-the-art methods.

TIME: Thursday 18/06, 14:00–14:30.
ROOM: Room 1 at IMAG.
SPEAKER: **Susanne Ditlevsen** (Copenhagen).
TITLE: *Estimating early warning signals and tipping points in climate.*
ABSTRACT: Early warning signals for tipping are typically second order statistics, namely increasing variance (loss of resilience) and increasing autocorrelation (critical slowing down). However, it is statistically challenging to estimate these from non-stationary data, which is exactly the case for systems approaching tipping points. Moreover, the systems are typically highly non-linear and noisy, and this even more so, the closer to the tipping point. I will discuss such statistical challenges for estimating essential quantities and doing statistical inference related to tipping systems.

TIME: Thursday 18/06, 14:30–15:00.
ROOM: Room 1 at IMAG.
SPEAKER: **Rémi Molinier** (Grenoble).
TITLE: *Partial insights into partial groups.*
ABSTRACT: For p a prime number, the study of p-local structures of finite groups, that is, of how a group acts on its p-subgroups by conjugation, lies at the heart of several branches of mathematics. It first arose in the classification of finite simple groups (especially for $p = 2$), but it also plays an important role in representation theory and algebraic topology. This topological perspective has been developed through strong international collaborations involving mathematicians from Denmark, such as Jesper Grodal and Jesper Møller, and from France, such as Bob Oliver, together with researchers from several other countries.

In 2013, Andy Chermak introduced partial groups, a new tool for studying p-local structures. Roughly speaking, a partial group is a group-like object in which not all products are defined. Although they originate in group theory, partial groups can also be viewed as simplicial sets, combinatorial objects that play a central role in algebraic topology. There is nowadays growing interest in partial groups among both group theorists and algebraic topologists. Recently, while we were both visiting Copenhagen, I happened to meet Philip Hackney, who had recently become interested in partial groups. During one of his talks, the question arose of whether a finite group could admit infinitely many partial subgroups. We eventually proved, by introducing a suitable notion of dimension, that every finite group has only finitely many partial subgroups.

In this talk, after some historical background on the emergence of partial groups, I will try to explain how they can be understood from the perspective of (symmetric) simplicial sets, and how this topological viewpoint can be powerful to study them.

TIME: Friday 19/06, 09:15–09:45.
ROOM: Room 1 at IMAG.
SPEAKER: **Francesco Campagna** (Clermont-Ferrand).
TITLE: *Almost 100 years of Artin's primitive root conjecture.*
ABSTRACT: Almost a century ago, in 1927, Emil Artin proposed a conjectural density for the set of primes p for which a given integer g is a primitive root mod p. Although elementary to state, Artin's conjecture touches on deep aspects of algebraic number theory and arithmetic geometry. In this talk, I will trace the history of Artin's

conjecture and explain the heuristic behind it. I will then discuss how the problem evolves in the context of elliptic curves, and highlight how the ideas initiated by Artin continue to inspire some of the current research in number theory (including mine).

TIME: Friday 19/06, 09:45–10:15.
ROOM: Room 1 at IMAG.
SPEAKER: **Olivier Wintenberger** (Paris).
TITLE: *Self-normalization of sums of dependent random variables.*
ABSTRACT: In this talk, we analyze the extremal dependence for regularly varying stationary time series. After introducing the extremogram as a specific tool to visualize the length of memory for extreme values, we study the joint limit behavior of sums, maxima, and standard deviations of samples. As a consequence, we can determine the distributional limits for ratios of sums and maxima, as well as studentized sums, even when the variance is infinite. We calculate moments of the limits and point out the differences between the iid (independent and identically distributed) and some other weakly dependent time series. We highlight some unknown side effects of the clustering of extremes in common ratio statistics.

Travail en collaboration Franco-Danoise avec T. Mikosch de Copenhague, et aussi M. Matsui d'Osaka.

TIME: Friday 19/06, 14:00–15:00.
ROOM: Room 1 at IMAG.
SPEAKER: **Round table**.
TITLE: *International collaboration in mathematics: HV spørgsmål (hvorfor, hvor, hvornår, hvordan?).*
ABSTRACT: The aim of the round table is to discuss several aspects of the development of an international partnership in mathematics, in particular between Denmark and France. We would like to exchange on the following topics:

1. Academia in Denmark and France: tenure, research funding, career expectations, open access, diversity.
2. International network: funding, ecology, working online/on-site, training new generations.
3. Future thoughts: mathematics, culture, diplomacy, AI.