

Workshop on optimal transport and functional inequalities

September 17, 2026. ENS Paris.

Speaker: Alexandros Eskenazis

Title: The dimensional Brunn-Minkowski conjecture

Abstract: I will present the latest developments on the dimensional Brunn-Minkowski conjecture for log-concave measures. A main goal of the talk is to draw parallels between the geometric, functional and entropic formulations of the problem.

Speaker: Joao Machado

Title: On the effective sharp stability of the Faber-Krahn inequality

Abstract: The Faber-Krahn inequality states that, among sets of fixed volume, balls minimize the first Dirichlet eigenvalue. Its sharp quantitative form controls the square of the Fraenkel asymmetry by the spectral deficit. Brasco, De Philippis and Velichkov proved this estimate through an argument using compactness, a contradiction step, and the selection principle of Cicalese-Leonardi; consequently, their stability constant is not computable. In this talk, we will discuss a proof with a computable dimensional constant, resolving Open Problem 2 in the survey of Brasco and De Philippis. The argument passes through the Saint-Venant inequality, which states that the torsion functional is maximised by balls. Its two main ingredients are a new level-set characterisation of the torsional deficit and a differential estimate for the distance of the level sets from a moving ball. These ingredients are connected by the strong quantitative isoperimetric inequality of Fusco and Julin. The Kohler-Jobin inequality then transfers the effective sharp stability of the Saint-Venant inequality back to Faber-Krahn.

This is joint work with André Guerra (Cambridge) and João P. G. Ramos (IMPA).

Speaker: Pierre Bizeul

Title: Gaussian-rate polynomial approximation for strongly log-concave measures

Abstract: It is well known that the standard Gaussian measure satisfies the Poincaré and logarithmic Sobolev inequalities with constant 1. Caffarelli's contraction theorem allows one to transfer both inequalities to measures that are log-concave with respect to the Gaussian measure, commonly referred to as strongly log-concave measures.

Another property of Gaussian space is that functions with bounded Sobolev norm can be approximated by polynomials of degree at rate $n^{-1/2}$, which may be viewed as a family of higher-order Poincaré inequalities. Using the heat semigroup, we extend this result to strongly log-concave measures. Finally, we explain that, within the class of log-concave measures, this polynomial approximation property implies the logarithmic Sobolev inequality.

Joint work with Bo'az Klartag.

Speaker: Jordan Serres

Title: On generalizations of Caffarelli's contraction theorem

Abstract: Emanuel Milman's conjecture asked whether any manifold diffeomorphic to a sphere and having Ricci curvature bounded below by a positive constant is the contractive volume-preserving image of a round sphere. The conjecture has been completely solved this year: it is only true in dimension 2. In this brief talk, I will attempt to describe its resolution and discuss some open problems it leaves.

Speaker: Anna Kazeykina

Title: Stability and exponential convergence of Sinkhorn for entropic martingale optimal transport

Abstract: We prove exponential convergence of the Sinkhorn algorithm for entropic martingale optimal transport. Our proof is based on a stability result for the EMOT. We first establish uniform boundedness and Lipschitz estimates for the dual potentials, up to affine gauges. We then construct a nearby martingale coupling with perturbed marginals, with quantitative control in terms of the change in the marginals. The construction relies on the invertibility of a suitable Fredholm operator.

Speaker: Eli Putterman

Title: Dimension-free stability estimates for the (B)-theorem

Abstract: The (B)-theorem of Cordero-Erausquin, Fradelizi and Maurey states that if γ_n denotes the standard Gaussian in dimension n , K is an origin-symmetric convex set, one has for any t that $\gamma_n(e^t K)^2 \geq \gamma_n(K)\gamma_n(e^{2t} K)$; this strengthens the Prékopa-Leindler inequality. Herscovici et al. (2023) proved a stability version of this result, showing that if one has equality up to a factor $1 + \delta$ then the inradius of K must be either "very large" or "very small", where the bounds depend on δ and on n . We will present a new, sharp, stability estimate which is dimension-free and also yields more precise information about bodies which are near-optimizers: every principal component of the covariance matrix of the measure obtained by restricting the Gaussian to K must either be at least $1 - O(\delta)$ or at most $O(\delta)$.

Speaker: Omer Friedland

Title: Sur le rayon de Banach–Mazur de ℓ_∞^n

Abstract: Nous montrons que tout espace normé de dimension n est à distance de Banach–Mazur $O(n^{2/3})$ de ℓ_∞^n .

Speaker: Katharina Eichinger

Title: Regularity and stability of diffusion transport maps

Abstract: Finding regular transport maps between measures is an important task in generative modelling and a useful tool to transfer functional inequalities. The most well-known result in this field is Caffarelli’s contraction theorem, which shows that the optimal transport map from a Gaussian to a uniformly log-concave measure is globally Lipschitz. Note that for our purposes optimality of the transport map does not play a role. This is why several works investigate other transport maps, such as those derived from diffusion processes, as introduced by Kim and Milman. Here, we establish a lower bound on the log-semiconcavity along the heat flow for a class of what we call asymptotically log-concave measures. We will see that this implies Lipschitz bounds for the heat flow map introduced by Kim and Milman. We will also show that these log-semiconcavity bounds are sufficient for stability of these maps in entropy and Wasserstein distance. The proofs of the stability are based on an interplay between certain functional inequalities along the heat flow, such as the Log-Sobolev inequality and Wang’s Harnack inequality.

Based on a joint work with Louis-Pierre Chaintron and Giovanni Conforti, and a joint work with Sinho Chewi and Aram-Alexandre Pooladian.

Speaker: Dario Cordero Erausquin

Title: Moment measures of log-concave measures after Klartag and Chen-Klartag

Abstract: We report on the recent proof by Chen and Klartag of the variance conjecture. It is a good occasion to review some properties of moment measures of log-concave measures.