THE WEIZMANN INSTITUTE OF SCIENCE
FACULTY OF MATHEMATICS AND COMPUTER SCIENCE
Geometric Functional Analysis and Probability Seminar

Room 155 ,Ziskind Building
on Thursday, Mar 05, 2020at 13:30

Emanuel Milman (Technion) & Tal Orenshtein (TU Berlin).

DOUBLE SEMINAR

Abstract:

Speaker #1: Emanuel Milman (Technion)

Title: Functional Inequalities on sub-Riemannian manifolds via QCD

Abstract:We are interested in obtaining Poincar\'e and log-Sobolev inequalities on domains in sub-Riemannian manifolds (equipped with their natural sub-Riemannian metric and volume measure).
It is well-known that strictly sub-Riemannian manifolds do not satisfy any type of Curvature-Dimension condition CD(K,N), introduced by Lott-Sturm-Villani some 15 years ago, so we must follow a different path. We show that while ideal (strictly) sub-Riemannian manifolds do not satisfy any type of CD condition, they do satisfy a quasi-convex relaxation thereof, which we name QCD(Q,K,N). As a consequence, these spaces satisfy numerous functional inequalities with exactly the same quantitative dependence (up to a factor of Q) as their CD counterparts. We achieve this by extending the localization paradigm to completely general interpolation inequalities, and a one-dimensional comparison of QCD densities with their "CD upper envelope". We thus obtain the best known quantitative estimates for (say) the L^p-Poincar\'e and log-Sobolev inequalities on domains in the ideal sub-Riemannian setting, which in particular are independent of the topological dimension. For instance, the classical Li-Yau / Zhong-Yang spectral-gap estimate holds on all Heisenberg groups of arbitrary dimension up to a factor of 4.
No prior knowledge will be assumed, and we will (hopefully) explain all of the above notions during the talk.

Speaker #2: Tal Orenshtein (TU Berlin)

Title: Rough walks in random environment
Abstract. In this talk we shall review scaling limits for random walks in random environment lifted to the rough path space to the enhanced Brownian motion. Except for the immediate application to SDEs, this adds some new information on the structure of the limiting path. Time permitted, we shall elaborate on the tools to tackle these problems. Based on joint works with Olga Lopusanschi, with Jean-Dominique Deuschel and Nicolas Perkowski and with Johaness BÃ¤umler, Noam Berger and Martin Slowik.

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