Open lectures for PhD students in mathematics

Probabilistic methods in convex geometry

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Course summary

The paradigm of employing probabilistic points of view on problems in convex geometry has showered us abundantly with many results ever since its early days in the 70s when the powerful idea of concentration of measure was used to establish Dvoretzky's theorem. Following this great legacy, I shall present several topics which have lately been near and dear to me. These topics may include (time permitting): log-concavity of sections of the cross-prolytope in the context of the logarithmic Brunn-Minkowski problem, bounds on sections of the regular simplex and its probabilistic extensions to negative moments, asymptotic bounds on Hadwiger's covering problem, and threshold phenomena for volume of high dimensional random polytopes.