

Speaker: Bence Borda, Graz University of Technology

Title: Equidistribution on compact groups

Abstract: The fundamental objects in classical discrepancy theory, such as axis parallel boxes on the torus or spherical caps on the sphere, do not readily generalize to other spaces. Working on a general metric space, a natural way to quantify how far a finite point set is from uniformity is to consider the worst case integration error with respect to the family of functions with a prescribed modulus of continuity. This is the so-called Wasserstein metric, a notion originating in the theory of optimal transportation. In this talk we discuss how certain deterministic and random constructions, such as the Lubotzky–Phillips–Sarnak construction on $SO(3)$ or random walks perform in the Wasserstein metric. This problem is closely related to the spectral gap conjecture, a deep unsolved problem in the theory of compact groups. The main tool is an Erdős–Turán type inequality on compact groups estimating the Wasserstein metric in terms of exponential sums. Finally, we consider the problem of strong equidistribution, and give a surprisingly simple quantitative solution for random walks on a general compact group.