Israel Mathematical Union meeting, September 8 2024

Analysis Session Schedule

- 14:00-14:40 Benjamin Weiss (Hebrew University)
- 14:55-15:35 Adi Glucksam (Hebrew University)
- 16:00-16:40 Andrei Lerner (Bar-Ilan University)
- 16:55-17:35 Liran Rotem (Technion)

Analysis Session Abstracts

Benjamin Weiss
On a problem of T-C Dinh and N. SIbony

Let $\mathcal{E}$ denote the space of entire functions with the topology of uniform convergence on compact sets. Let $\mathcal{U}$ denote the set of entire functions that have a dense orbit under the action by translations $T_c f(z) = f(z+c)$. Almost a century ago G. D. Birkhoff showed that $\mathcal{U}$ is not empty. Their problem is does there exist an invariant probability measure μ on $\mathcal{E}$ such that μ-a.e. f belongs to $\mathcal{U}$. I will show how an old construction of mine can be modified to provide a positive answer to their question.

Adi Glucksam
Multi-fractal spectrum of planar harmonic measure

In this talk, I will define various notions of the multi-fractal spectrum of harmonic measures and discuss finer features of the relationship between them and properties of the corresponding conformal maps. Furthermore, I will describe the role of multifractal formalism and dynamics in the universal counterparts. This is a developing story, based on a joint work with I. Binder.

Andrei Lerner
A boundedness criterion for the maximal operator on variable Lebesgue spaces

There are two basic generalizations of the classical L^p spaces: weighted L^p spaces and variable L^p spaces. The boundedness of the Hardy-Littlewood maximal operator on weighted L^p spaces was fully characterized by B. Muckenhoupt in 1972. In this talk we will discuss a similar problem for variable L^p spaces, and, in particular, a boundedness criterion found quite recently, in 2023. The talk is self-contained and no prior knowledge is assumed.

Liran Rotem

The (B)-inequality and its stability

The (B) inequality is a concavity property of the Gaussian measure, proved by Cordero-Erausquin, Fradelizi and Maurey. Together with Cordero-Erausquin we extended the inequality to a large family of non-Gaussian measures.

The original proof of the inequality involves smooth approximations and therefore gives no information about the equality cases. In this talk we will settle this issue in the Gaussian case by proving a stability result: If the inequality is "almost" an equality, the body involved should be "close" to either the whole space or a lower dimensional body. This is in fact an analytic result, which boils down to studying the stability of Poincaré-type inequalities on Gauss space. We will also give a geometric application of our characterization of the equality cases.

Based on joint work with Orli Herscovici, Galyna Livshyts and Sasha Volberg.