TEMPLE UNIVERSITY

Department of Mathematics

Analysis Seminar

Room 617 Wachman Hall

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A harmonic measure for sets of higher codimensions

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Abstract: Let Ω is a open bounded subset of $\mathbb{R}^n$ and Γ is its boundary. Recent works established a relationship between the geometry of the boundary Γ and estimates on the solutions of the Dirichlet problem for the Laplacian in the domain Ω. More precisely, under some conditions of topology, Γ is uniformly rectifiable if and only if the harmonic measure is absolutely continuous (in a quantitative way) to the surface measure. This nice criterion is unfortunately limited to the case where Γ is of dimension $n-1$, because the condition is necessary to construct the harmonic measure.

I will present in this talk how, together with Guy David and Svitlana Mayboroda, we contructed an analogue of the harmonic measure on Γ when $\Gamma \subset \mathbb{R}^n$ is a set of codimension higher than 1. I will discuss about the properties of our new measure that are similar to the real harmonic measure, and our unsolved problems.