Engelstein, Max (MIT, USA) Singular Points for Harmonic Measure

Abstract: Relating the geometry of a set to the properties of the harmonic measure it supports is a bustling area of investigation. One particularly nice result in this vein is due to Kenig and Toro, who showed, under suitable assumptions on size of the set and the topology of its complement, that the oscillation of the Radon-Nikodym derivative of the harmonic measure with respect to surface measure controls the oscillation of the unit normal at "most" points.

In this talk we will investigate the points where we do not have control: the complement of "most". In particular, we show that these points are contained in a rectifiable set of co-dimension at least three. The proof is based on the Rectifiable-Reifenberg/Quantitative stratification approach of Naber-Valtorta, first developed to study problems from geometric analysis.

Much of this is joint work with Nick Edelen (MIT) but if we have time we will also touch on work in progress with Xavier Tolsa (ICREA).