Tolsa, Xavier (ICREA and Universitat Autònoma de Barcelona, Spain) Harmonic measure via blow up methods and monotonicity formulas

Abstract: Harmonic measure plays an important role in the solution of the Dirchlet problem for the Laplacian. The study of the geometric properties of harmonic measure is a classical topic in analysis, with connections to complex analysis, harmonic analysis, and geometric measure theory. In this minicourse I will explain how blow up methods can be applied to prove several results in this area. In particular, we will see an easy proof of Tsirelson's theorem about triple points for harmonic measure using these techniques. I will also explain the essential role of some monotonicity formulas, well known in the area of free boundary problems, for the study of other related questions, such as the two-phase problem for harmonic measure.