

## Calderón-Zygmund Analysis Seminar

Monday, May 24th, 3:45 pm

### Radon measures and Lipschitz graphs: how to detect rectifiability in the absence of doubling

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**Abstract.** Connections between Lipschitz graphs and the geometry of measures in Euclidean space has been studied for over ninety years, beginning with foundational papers by Besicovitch, Morse-Randolph, and Federer from the 1920s–1940s. Radon measures supported on smooth Lipschitz graphs supply a model for generalized surfaces in connection with Plateau’s problem. Beyond GMT, understanding the rectifiability of measures with respect to Lipschitz graphs is crucial to the study of boundedness of SIOs and absolute continuity of harmonic measure on rough domains.

I will describe joint work with Lisa Naples. For all  $1 \leq m \leq n-1$ , we supply a pointwise characterization of Radon measures in  $\mathbb{R}^n$  that are carried by or singular to  $m$ -dimensional Lipschitz graphs. In contrast with classical theorems on rectifiability, our test requires no *a priori* assumptions on the density or dimension of the measure. This advance requires incorporation of techniques from harmonic analysis. A central idea to combat the possibility of non-doubling that may be useful in other settings is to introduce anisotropic normalizations.