GEOMETRIC ANALYSIS SEMINAR

" Uniqueness of blow-ups and asymptotic decay for Dirichlet energy minimizing multi-valued functions"

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Abstract: In the early 1980's Almgren developed a theory of Dirichlet energy minimizing multi-valued functions, proving that the Hausdorff dimension of the singular set (including branch points) of such a function is at most (n-2) where n is the dimension of its domain. Almgren used this bound in an essential way to show that the same upper bound holds for the dimension of the singular set of an area minimizing n-dimensional rectifiable current of arbitrary codimension. In either case, the dimension bound is sharp. I will describe joint work with Brian Krummel in which we develop estimates to study the asymptotic behaviour of a Dirichlet energy minimizing q-valued function on approach to its branch set. Our estimates imply that a Dirichlet energy minimizer at a.e. point along its branch set (with respect to the (n-2)-dimensional Hausdorff measure) has a unique set of homogeneous multi-valued cylindrical tangent functions (blow-ups) to which the minimizer, modulo a set ofsingle-valued harmonic functions, decays exponentially fast upon rescaling. A corollary is that the branch set is countably (n-2)-rectifiable (also established recently by a different method by De Lellis, Marchese, Spadaro and Valtorta). This work generalizes our earlier work in which we treated the special case q=2 and announced the general results; the general case requires some different and new ideas which I shall outline.

Monday November 20, 2017
MIT, Room 2-146
Time: 4:00PM-5:00PM

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