Department of Mathematics
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Paul Minter - Princeton University

GEOMETRIC ANALYSIS SEMINAR

Speaker: Paul Minter
Princeton University

Date: Thursday, March 9, 2023
Time: 11:00 AM
Location: 258 Hurley Hall
Zoom URL: NA

Lecture Title:

The structure and regularity of branched stable minimal hypersurfaces

Abstrac

Understanding how smoothly immersed, stable, minimal hypersurfaces can degenerate under uniform volume bounds is a well-known problem within geometric analysis and geometric measure theory. In low dimensions, the work of Schoen-Simon-Yau provides uniform curvature estimates. However, for arbitrary dimensions the problem is still open. A key issue to understand is singular points of higher multiplicity, with a branch point being the main example. A priori, the topological structure about branch points could be very complicated, with, for example, a sequence of "necks" degenerating toward the point; indeed, the branch set could even have positive measure. In this talk, I will discuss some recent results in this direction. We prove several regularity theorems in this setting, including some uniqueness of tangent cones results, which allow for branch points and make no a priori assumption on the size of the singular set. A key aspect of our argument is being able to prove monotonicity of a frequency function for the linearised problem (i. e blow-ups), despite the blow-ups not satisfying any variational principle a priori (which is the case, for example, in the area-minimising setting and the multiplicity one setting). Some results are joint with Neshan Wickramasekera (University of Cambridge).