GEOMETRIC ANALYSIS SEMINAR

Gang Zhou

(Department of Mathematical Sciences, Binghamton University)

Title: "Generic singularity of mean curvature flow: formations and detailed descriptions before and at the blowup time"

Abstract: In this talk I will present the progresses I and my collaborators, including Michael Sigal and Dan Knopf, made in the past few years. We developed a new way of studying mean curvature flow, and we are using it to understand the evolution of hypersurfaces under mean curvature flow. Our latest results show that, in a considered generic regime, the singularity is isolated, and a space and time neighborhood is mean convex. The latter confirms a conjecture by Ilmanen about mean convexity of neighborhood of singularity.

Paul Feehan

(Rutgers University)

Title: "Lojasiewicz inequalities and Morse-Bott functions"

Abstract: The Lojasiewicz gradient and distance inequalities for real analytic functions on Euclidean space were first proved by Stanislaw Lojasiewicz (1965) using methods of semianalytic and subanalytic sets, arguments later simplified by Bierstone and Milman. We shall first describe a more direct proof of the Lojasiewicz gradient inequality that uses resolution of singularities for real analytic varieties to reduce to the case of functions with simple normal crossings, where the Lojasiewicz exponent may be computed explicitly — thus giving insight into its geometric meaning. It is well-known and easy to prove that if a function on a Banach space is Morse-Bott, then its Lojasiewicz exponent is 1/2. We show that the less obvious converse is also true: if the Lojasiewicz exponent of an analytic function on a Banach space is 1/2 at a critical point, then the function is Morse-Bott on a neighborhood of that point. We illustrate these phenomena with applications of Lojasiewicz inequalities to the Yang-Mills energy function near the critical set of flat connections on a principal G-bundle over a closed Riemannian manifold.

Wednesday, October 10th, 2018

Gang Zhou -- 4:00-5:00pm

Paul Freeham -- 5:00-6:00pm

MIT, Room 2-131

Massachusetts Institute of Technology