Debora Impera

Politecnico di Torino

Quantitative index bounds for f-minimal hypersurfaces in the Euclidean space

Abstract

The recent developments in the existence theory for minimal immersions have motivated a renewed interest in studying estimates on the Morse index of these objects. One possible way to control instability is through topological invariants (in particular through the first Betti number) of the minimal hypersurface. This was first investigated by A. Ros for immersed minimal surfaces in R^3, or a quotient of it by a group of translations, and then, in higher dimension, by A. Savo when then ambient manifold is a round sphere. In this talk we will first discuss how the method used by Savo can be generalized to study the Morse index of self-shrinkers for the mean curvature flow. In particular, when the hypersurface is compact, we will show that the index is bounded from below by an affine function of its first Betti number. In the complete non-compact case, the lower bound is in terms of the dimension of the space of weighted square integrable f-harmonic 1-forms. In particular, in dimension 2, the procedure gives an index estimate in terms of the genus of the surface.

Finally, if time permits, I will also discuss how to obtain quantitative estimates on the Morse index of translators for the mean curvature flow with bounded norm of the second fundamental form via the number of ends of the hypersurface.

This talk is based on joint works with Michele Rimoldi and Alessandro Savo.