Special Colloquium

DR. GREGORY CHAMBERS

UNIVERSITY OF CHICAGO

"PROBLEMS IN QUANTITATIVE GEOMETRY"

Quantitative geometry is a broad field concerned with geometric problems in which quantitative properties play a central role. My research investigates questions of this type from quantitative topology, and from geometric analysis. I will describe some of these problems, sketch the main ideas involved in their solutions, and discuss future directions.

In particular, I will answer the following questions. Suppose that two simple closed curves in a Riemannian surface are homotopic through curves of length less than L . Are they isotopic through curves obeying the same length bound? Suppose that $f : X \to Y$ is a null-homotopic map with Lipschitz constant L . Under what conditions does there exist an L-Lipschitz null-homotopy? If M is a null-cobordant manifold, then how complex must a manifold which fills M be? If the Coulomb energy of a set is close to maximal, then does the set have to be close to a ball? What are the isoperimetric regions in $\mathbb{R}^n$ with a density that is smooth, radially symmetric, and log-convex? Do non-compact complete manifolds of finite volume contain minimal hypersurfaces?

Monday, February 6th, 2017

Room 284, the 2nd Floor of the Surge Building

Tea Time @ 3:40 p.m.

Talk Begins @ 4:10 p.m.

Ends @ 5:00 p.m.

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