Topology Seminar

Ilya Grigoriev

of University of Chicago will be speaking on

Characteristic classes of manifold bundles

on September 15 at 4:30 in
MIT Room 2-131

Much like for vector bundles, one can attempt to study bundles with fiber a manifold using characteristic classes, which are invariants that correspond to elements of the cohomology ring of the classifying space BDiff M. The easiest of these to define are the so-called "generalized Miller-Morita-Mumford classes". In the case when the manifold $M = S_g$ is a surface, the Madsen-Weiss theorem together with Harer stability imply that as g grows, a large number of these classes become *non-zero*. On the other hand, relationship between BDiff S_g and the moduli space of Riemann surfaces (which has finite dimension) implies that a large number of these classes *are* zero.

Recently, Galatius and Randall-Williams proved an analogue of the Madsen-Weiss theorem and of Harer stability for the case when M is a connected sum of products of spheres $S^d \times S^d$. I will describe the implications of their results on the study of generalized MMM-classes, other vanishing and non-vanishing results about the MMM-classes for such manifolds, and whether BDiff M could be modeled by a finite-dimensional space.