Topology Seminar

Chris Kottke

of New College of Florida will be speaking on

Transgression, fusion, and cohomology of free loop spaces

on October 17 at 4:30 in
MIT Room 2-131

In the geometry and analysis of loop spaces, a fundamental question is how to characterize geometric objects (functions, resp. line bundles, etc.) on the loop space of a manifold which are related by transgression to objects one degree higher (line bundles, resp. gerbes, etc.) on the manifold itself. There are various geometric results of this sort for low degrees, in which a key role is played by 'fusion' – a (partially defined) binary operation on loop space which was first introduced by Stolz and Teichner and further developed by Waldorf.

I will present a joint result with Richard Melrose which answers this question for arbitrary degree in cohomology. More precisely, we define an enhanced version of Cech cohomology of the continuous loop space of M in terms of fusion and a second 'figure-of-eight' product, through which transgression from M factors as an isomorphism, and which can be iterated to higher loop spaces.