BOSTON UNIVERSITY MATHEMATICS COLLOQUIUM

Chern-Weil forms and abstract homotopy

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Abstract: Chern-Weil and Chern-Simons forms are basic objects in differential geometry and have numerous applications. In joint work with Mike Hopkins we prove that these are the only canonical differential forms attached to a connection. The formulation and proof use abstract homotopy theory.

There will be a pre-talk by Tom McCauley at 2:30 pm in MCS 148. Title: Curvature and characteristic classes. Abstract: The classical notion of the Gaussian curvature of a surface can be extended to the more general setting of a vector bundle over an n-dimensional manifold, E over M, by defining the curvature 2-form of the bundle. The curvature 2-form is constructed from a connection on the bundle, which is a directional derivative operator acting on sections of the bundle. Using the Chern-Weil homomorphism, the curvature 2-form can be used to define characteristic classes, a ring of cohomology classes on M built from the data of the bundle E. We will define characteristic classes and look at how the geometric construction provides information about the underlying topology of M.

Tea will be served at 3:30 pm in MCS 144.