

MATH 80430: Topics in Topology I

Fall 2014

Mark Behrens

This course will be an introduction to stable homotopy theory. Stable homotopy theory is, roughly speaking, the study of the homotopy theory of spaces after arbitrarily high suspensions are taken. It is an approximation to homotopy theory where the basic invariants are more amenable to computation (for instance, stable homotopy groups satisfy excision, unlike ordinary homotopy groups). After introducing the basic definitions (spectra), we will focus on motivating applications and computations, including the Hopf invariant one problem, K-theory, cobordism, and the Adams spectral sequence. Prerequisites include homology and cohomology, manifolds and vector bundles, some basic homotopy theory, and some basic category theory would be helpful. I will introduce topics as needed, including spectral sequences.