Topology Seminar

John Harper

of École Polytechnique Fédérale de Lausanne will be speaking on

Bar constructions and Quillen homology of modules over operads

on March 2 at 4:30 in
MIT Room 2-131

In Haynes Miller's proof of the Sullivan conjecture on maps from classifying spaces, Quillen's derived functor notion of homology (in the case of commutative algebras) is a critical ingredient. This suggests that homology for the larger class of algebraic structures parametrized by an operad will also provide interesting and useful invariants. Working in the two contexts of symmetric spectra and unbounded chain complexes, we establish a homotopy theory for studying Quillen homology of modules and algebras over operads, and we show that this homology can be calculated using simplicial bar constructions. A key part of the argument is proving that the forgetful functor commutes with certain homotopy colimits. A larger goal is to determine the extra structure that appears on the derived homology and the extent to which the original object can be recovered from its homology when this extra structure is taken into account. This talk is an introduction to these results with an emphasis on several of the motivating ideas.