The stable cohomology of the mapping class group with arbitrary coefficients

Stavros Garoufalidis
Department of Mathematics
Harvard University

Abstract

Mumford and Morita conjectured that the stable cohomology of the mapping class group is a free polynomial algebra in the set of cohomology classes that they defined. It is natural to ask about the structure of the stable cohomology with arbitrary symplectic coefficients. Contrary to inuition, this problem can be solved exactly, and algorithmically, modulo the conjecture of Mumford-Morita. The solution leads to a new version of graph cohomology, and gives a strong test for the Mumford-Morita conjecture. Assuming a Koszulity condition, this leads to a calculation of the Malcev completion of the Torelli group, and further to relations with finite type invariants of 3-manifolds. This is joint work with Ezra Getzler.