



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

Mathematics Colloquium

March 20, 2024
3:30 - 4:30 PM
Phillips Hall 332

Galois actions on cohomology of algebraic varieties

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Abstract. This talk will be an overview of a few big open problems which are of great importance in arithmetic algebraic geometry, number theory, and representation theory. The focus will be on the weight-monodromy conjecture and the Frobenius semisimplicity conjecture. I will mention some connections of these with Hodge theory and with the Tate conjecture, respectively. In addition, I will try to explain the importance of these problems to the computation of Hasse-Weil zeta functions of algebraic varieties over number fields, and outline some expectations and some ways of circumventing our lack of knowledge about these conjectures. Most of the talk will not concern my own work, but if time permits I will explain some recent progress on related matters in special cases.