Math 296 - Graduate Student Colloquium

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The arithmetic of special values of L-functions

Abstract:
The well-known analytic class number formula, linking the special value at s=0 of the Dedekind zeta function of a number field to its class number and regulator, has been the foundation and prototype for the highly conjectural theory of special values of L-functions for close to two centuries. We will discuss generalizations of the class number formula to the context of equivariant Artin L-functions which capture refinements of the Brumer-Stark and Coates-Sinnott conjectures. These generalizations relate various algebraic-geometric invariants associated to a global field, e.g. its Quillen K-groups and etale cohomology groups, to various special values of its Galois-equivariant L-functions. They illustrate the subtle interactions of number theory with complex and p-adic analysis, algebraic geometry, topology and homological algebra.

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