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Monday, December 10, 2012
4:00 PM
231 Hayes-Healy Hall

Title: Comparisons of arithmetic objects using deformations

Abstract:

A generalization of Dirichlet's theorem on the infinitude of prime numbers in arithmetic progressions implies that a finite dimensional continuous representation of the Galois group of \mathbb{Q} is uniquely determined by its behavior at all but finitely many prime numbers. Such comparison results are desirable as often arithmetic objects are easily described at all but finitely many primes.

Using a combination of complex and 'p-adic' analysis one can obtain such comparison results in the case of certain arithmetically significant power series, called modular forms. The complex analysis part involves a trick using transcendence. The p-adic analysis part involves the deep fact that along certain deformations of these power series (arising from algebraic geometry) the roots of certain complex rational functions vary continuously.