

**Number theory and Representation
Theory seminar, Fall 2007
East Hall 4096
September 10, 3:10-5:00pm
(tea break at 4pm)**

Tate's conjecture in fibers of a pencil

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Abstract

Let k be a finitely generated field, and E a non-isotrivial elliptic curve over $k(t)$. If k is finite then the function-field analogue of a conjecture of Goldfeld asserts that the average rank of all quadratic twists of E is well-defined and equal to $\frac{1}{2}$. If k is infinite then we prove that this average rank is well-defined and equals 0. At the heart of the proof is a theorem which asserts that for “most” one-parameter families of twists, almost all k -fibers of the family have rank 0. The methods used to prove the theorem apply to other one-parameter families of varieties, and in particular they allow one to show that the Tate conjectures are true for almost all k -fibers in the family.