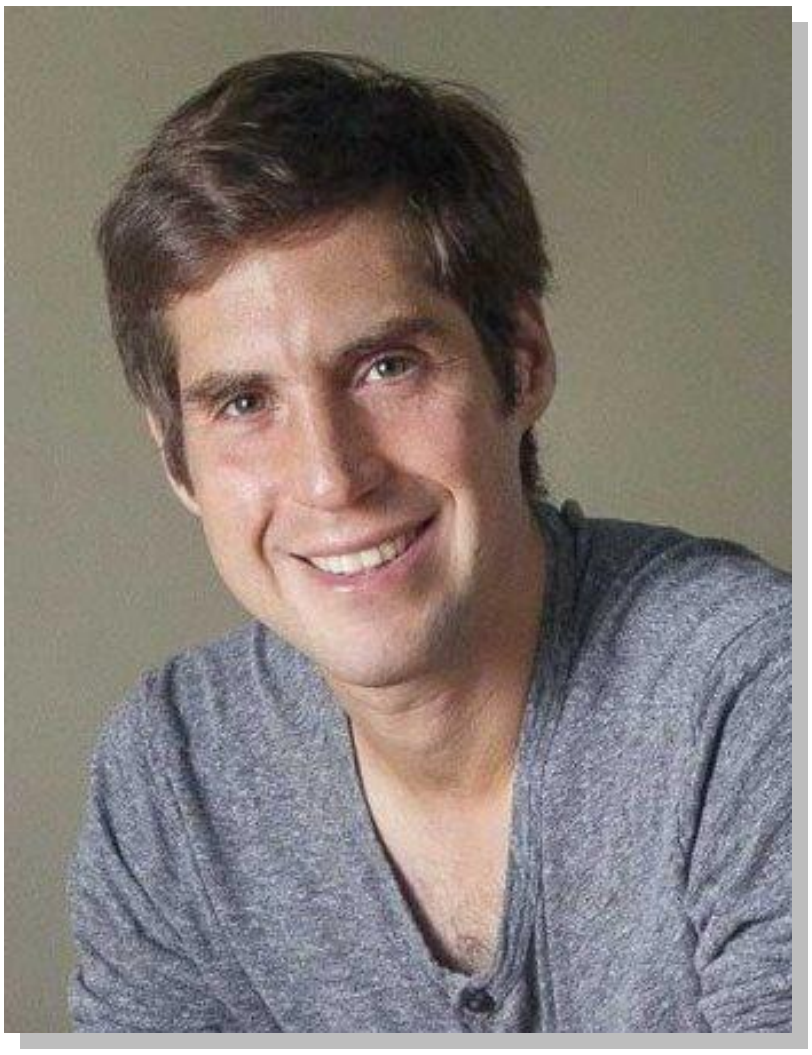
2018 Distinguished Lecture Series

Weil's Conjecture Revisited



Jacob Lurie

Harvard University

Let L be a positive definite lattice. There are only finitely many positive definite lattices L' which are isomorphic to L modulo N for every $N > 0$: in fact, there is a formula for the number of such lattices, called the Smith-Minkowski-Siegel mass formula. In the first lecture, I'll review the Siegel mass formula and explain a reformulation (due to Tamagawa and Weil) in terms of the volumes of certain adelic groups. This reformulation led Weil to conjecture a generalization of the mass formula, which applies to any (simply connected) semi-simple algebraic group G over any global field K. In the second lecture, I'll discuss the meaning of this conjecture in the case where K is a function field (that is, a finite extension of for some prime number p), and explain how it can be $F_p(x)$, reformulated as a statement about the cohomology of certain moduli spaces. In the third lecture, I'll discuss recent joint work with Dennis Gaitsgory, applying ideas from algebraic topology to compute the relevant cohomology groups and thereby obtain a proof of Weil's conjecture in the function field case.

Lecture 1:
"The Siegel Mass Formula and Weil's Conjecture" - Tuesday, October 16, 2018, 3:00 – 3:50 p.m. MS 6627

Lecture 2:
"Weil's Conjecture for Function Fields" - Wednesday, October 17, 2018, 3:00 – 3:50 p.m. MS 6627

Lecture 3:
"Weil's Conjecture via Factorization Homology" - Thursday, October 18, 2018, 3:00 – 3:50 p.m., MS 6627

UCLA College
Mathematics

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