



Frontiers of Mathematics Lecture

Arithmetic of Algebraic curves

Abstract

In his memoir in 1900, Henri Poincaré proposed a program to study the arithmetic of algebraic curves according to its intrinsic geometric properties. This led to tremendous achievements in the 20th century, including the proof of the Mordell-Weil theorem (Mordell 1922, Weil 1928), the Mordell conjecture (Faltings 1983), and Fermat's last theorem (Wiles 1994). In a series of three lectures, I will describe the early history and recent developments concerning the arithmetic of curves and related varieties.

Lecture 1: Rational points

Lecture 2: Ceresa and Gross—Schoen cycles

Lecture 3: Triple product of L-series

The Frontiers of Mathematics Lecture is the first of the lecture series, and Lectures 2 and 3 are separately announced.

Biography

Professor Shouwu Zhang obtained his Ph.D. at Columbia University in 1991. He was a member of the Institute for Advanced Study, Princeton and in 1991-92 and was on the faculty of the Department of Mathematics at Princeton University in 1992-96. In 1996, he moved back to Columbia University where he was promoted to Professor in 1998. He has been a professor at Princeton University since 2011 and was named Eugene Higgins Professor since 2021.

Professor Zhang is well-known for his contributions to number theory, arithmetic dynamics and arithmetic algebraic geometry, among other things for his works on Arakelov geometry, on the equidistribution of small points on Abelian varieties (in part with Lucien Szpiro and Emmanuel Ullmo) and the Bogomolov conjecture, in the theory of positive line bundles on arithmetic varieties, in his work (partly in collaboration with Xinyi Yuan and Wei Zhang) generalizing the Gross-Zagier theorem to Shimura curves, and for his joint work with Xinyi Yuan proving the averaged version of the Colmez conjecture which led to the confirmation (by Jacob Tsimerman) of the André-Oort Conjecture for Siegel modular varieties. Professor Zhang received a Sloan Foundation Research Fellowship (1997) and a Morningside Gold Medal of Mathematics (1998). He is also a Clay Foundation Prize Fellow (2003) and a Guggenheim Foundation Fellow (2009). He is Fellow of the American Academy of Arts and Sciences and Fellow of the American Mathematical Society. He was an Invited Speaker at the International Congress of Mathematicians in Berlin (1998).



Professor Shouwu ZHANG

Princeton University

Date :
December 8, 2025 (Monday)

Time :
4:30 – 5:30 pm

Venue :
Lecture Theatre A, G/F,
Chow Yei Ching Building,
The University of Hong Kong