

**SPEAKER:** Ivan Fesenko (Nottingham)

**TITLE:** Adelic analysis on arithmetic surfaces

**ABSTRACT:** The talk will present some of the key concepts and methods of two-dimensional adelic analysis on regular models  $X$  of elliptic curves over global fields. A two-dimensional version of the theorem of Tate and Iwasawa will be explained. It reduces the study of the zeta function and zeta integral to the study of a certain boundary integral over some two-dimensional adelic space. This, in turn, gives a new method to study such fundamental open problems as: meromorphic continuation and functional equation, the generalized Riemann hypothesis, and the Birch-Swinnerton-Dyer conjecture for the zeta function of  $X$ .

**Title for the RTG seminar:** Introduction to two-dimensional commutative class field theory

**Abstract:** A two-dimensional global field in characteristic zero is a finitely generated field over  $\mathbb{Q}$  of transcendence degree 1 over the rationals. An important nontrivial example is the function field of an elliptic curve over a number field. Two-dimensional (commutative) class field theory studies abelian extensions of two-dimensional global fields. In this talk we discuss some of the main ideas and concepts.