Geometry and analysis on formal-analytic arithmetic surfaces

Abstract: Formal-analytic arithmetic surfaces are geometric objects defined by glueing two-dimensional formal schemes over the integers and compact Riemann surfaces with boundary. They may be seen as arithmetic counterparts of germs of complex analytic surfaces around complex projective curves, and naturally arise in diverse questions of Diophantine geometry.

Spaces of sections of vector bundles over such formal-analytic arithmetic surfaces admit real valued invariants, defined in terms of suitable theta series. These invariants and their finiteness properties may be used to investigate the algebraicity properties of formal-analytic arithmetic surfaces and to derive some Diophantine applications. (Joint work with F. Charles.)