A p-adic construction of Heegner points in the additive reduction case

Carlos de Vera Piquero[1]

Let E be an elliptic curve over $\mathbb{Q}$, and K a quadratic field such that the sign of the functional equation of the L-series associated with E/K is -1. One of the main problems in number theory is to construct a non-torsion point on E rational over K, whose existence is predicted by the Birch–Swinnerton-Dyer conjecture. The most general constructions available so far are via the so-called *Heegner points*, arising from either modular or Shimura curves.

Suppose $p \geq 5$ is a prime of additive reduction for E. In contrast to the multiplicative reduction case, the Shimura curves that provide modular parametrisations for E might not admit a p-adic uniformisation by Drinfeld's p-adic upper half plane $\mathcal{H}_p$. Nevertheless, the theory of Čerednik and Drinfel'd still provides rigid analytic uniformisations for these Shimura curves at the cost of replacing $\mathcal{H}_p$ by a suitable étale cyclic covering of it, which eventually lead to modular parametrisations of E. These p-adic modular parametrisations are the starting point of a joint work *in progress* with M. Longo and V. Rotger, in which we investigate a (new) p-adic construction of Heegner points on elliptic curves. The aim of the talk is to report on some of the main ingredients involved in this project.

[1]Fakultät für Mathematik,
 Universität Duisburg-Essen,
 Thea-Leymann-Str. 9, 45127 Essen, Germany.
 carlos.de-vera-piquero@uni-due.de