Debrecen Number Theory Seminar

14 April 2023. – 13:00-13:50 Location: M402

Samuel Le Fourn: Quadratic Chabauty for modular curves and modular forms of rank 1

The classical Chabauty method, designed to determine fully rational points of a given algebraic curve, works when the rank of the Mordell-Weil group of its jacobian is less than its genus. This has been adapted with great success to modular curves by Mazur, Momose, Bilu, Parent and others, but some cases remained because this inequality was not satisfied.
A few years ago, Balakrishnan, Dogra, Müller and others designed so-called "quadratic Chabauty method" which has a weaker inequality on the rank, but is much more involved for practical applications.
In this talk, I will explain a joint work with Netan Dogra where we prove that quadratic Chabauty method applies in principle to families of modular curves previously resistant to classical Chabauty, and the difficulties raised to apply it completely.