Exposé court

35   *Generalised Jacobians of modular curves and their $\mathbb{Q}$-rational torsion.*

Curcó-Iranzo, Mar (Utrecht university)

The Jacobian $J_0(N)$ of the modular curve $X_0(N)$ has received much attention within arithmetic geometry for its relation with cusp forms and elliptic curves. In particular, the group of $\mathbb{Q}$-rational points on $X_0(N)$ controls the cyclic N-isogenies of elliptic curves. A conjecture of Ogg predicted that, for N prime, the torsion of this group comes all from the cusps. The statement was proved by Mazur and later generalised to arbitrary level N into what we call generalised Ogg's conjecture. Consider now the generalised Jacobian $J_0(N)_{\mathbf{m}}$ with respect to a modulus $\mathbf{m}$. This algebraic group also seems to be related to the arithmetic of $X_0(N)$ through the theory of modular forms. In the talk we will present new results that compute the $\mathbb{Q}$-rational torsion of $J_0(N)_{\mathbf{m}}$ for N an odd integer with respect to a cuspidal modulus $\mathbf{m}$. These generalise previous results of Yamazaki, Yang and Wei. In doing so, we will also discuss how our results relate to generalised Ogg's conjecture.