Welcome Home Workshop 2014

NOME: Fabrizio

COGNOME: Barroero

AFFILIAZIONE: Scuola Normale Superiore di Pisa

POSIZIONE: Assegnista di ricerca

EMAIL: fbarroero@gmail.com

LINGUA PER LA CONFERENZA: inglese (volendo anche in italiano)

TITOLO: Linear relations in families of powers of elliptic curves

COAUTORI: Laura Capuano

Abstract

Consider the curve E_λ of equation $y^2 = x(x-1)(x-\lambda)$. This is an elliptic curve defined over $\mathbb{Q}(\lambda)$ and it is well known that its points together with the point at infinity form an abelian group. We can also think of E_λ as a family of elliptic curves E_{λ_0}, for $\lambda_0 \in \mathbb{C} \setminus \{0,1\}$. Consider the two points $(2, \sqrt{2(2-\lambda)})$ and $(3, \sqrt{6(3-\lambda)})$. They are independent on the generic curve E_λ but they might become dependent on some E_{λ_0}. Masser and Zannier proved that there are at most finitely many λ_0 such that there are two independent relations between the two points, i.e. they are torsion, on the specialized curve E_{λ_0}. They later generalized this result substituting 2 and 3 with any distinct abscissa different from 0 and 1. In our work we consider an higher dimensional analogue. For instance we proved that there are at most finitely many λ_0 such that the points $(2, \sqrt{2(2-\lambda_0)})$, $(3, \sqrt{6(3-\lambda_0)})$ and $(5, \sqrt{20(5-\lambda_0)})$ satisfy two independent relations on E_{λ_0}.