Abelian division fields

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Monday, April 6 at 4:15 pm
111 Cummington Mall, MCS B21
Tea and cookies in MCS 144 at 3:45 pm

Abstract: Let $E$ be an elliptic curve over $\mathbb{Q}$, and let $n \geq 2$. It is a well-known fact that the division field $\mathbb{Q}(E[n])$ contains the $n$-th roots of unity, due to the existence of the Weil pairing. In this talk we will give a complete classification and parametrization of all elliptic curves with minimal division fields, i.e., those curves with $\mathbb{Q}(E[n]) = \mathbb{Q}(\mu_n)$, for some $n \geq 2$. More generally, we will give a complete classification of all curves such that the division field $\mathbb{Q}(E[n])$ is abelian for some $n \geq 2$. This is joint work with Enrique González-Jiménez.