

BOSTON UNIVERSITY NUMBER THEORY SEMINAR

## 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.