Bonini Matteo  
PhD Student in Mathematics

**On the intersection of curves and their link to the weight enumerators of algebraic-geometric codes**

**Abstract:**

One of the most difficult problems in coding theory is the determination of the weight distribution of a given linear code. In the case of algebraic-geometric codes sometimes it is possible to partially solve this problem studying the intersections between the chosen curve and the curves of a given degree (e.g. lines, conics...). After a brief introduction to the algebraic-geometric codes we will discuss the importance of the determination of the intersections between curves in this context: in particular we will talk about the maximal intersections between the Giulietti-Korchmaros curve and the curves with degree lower or equal to three and the intersections between the norm-trace curve, a natural generalization of the Hermitian curve, and curves of the form $y=P(x)$ where $P$ has degree two or three.

**Supervisors:**

Massimiliano Sala e Giancarlo Rinaldo