On linear systems of conics over finite fields

Michel Lavrauw

Sabancı University

A form on an $n$-dimensional projective space $\mathbb{P}^n$ is a homogeneous polynomial in $n+1$ variables. The forms of degree $d$ on $\mathbb{P}^n$ comprise a vector space $W$ of dimension $\binom{n+d}{d}$. Subspaces of the projective space $\mathbb{P}W$ are called linear systems of hypersurfaces of degree $d$. The problem of classifying linear systems consists of determining the orbits of such subspaces under the induced action of the projectivity group of $\mathbb{P}^n$ on $\mathbb{P}W$. In this talk we will focus on linear systems of quadratic forms on $\mathbb{P}^2$ over finite fields. We will give an overview of what is known and explain some of the recent results. This is based on joint work with T. Popiel and J. Sheekey.