

Speaker: Thomas Bouchet

Title: Invariants of genus 4 curves

Abstract. In this talk, we will focus on algebraic invariants of non-hyperelliptic genus 4 curves defined over an algebraically closed field of characteristic 0. Given two non-hyperelliptic curves of genus 4, algebraic invariants give us an easy way to check if they are isomorphic.

The problem of identifying the isomorphism class of a non-hyperelliptic curve of genus 4 reduces to the study of the action of $SL_2 \times SL_2 \rtimes \mathbb{Z}/2\mathbb{Z}$ on bihomogeneous forms of bidegree $(3, 3)$. We compute the Hilbert series of this algebra of invariants, using the theory of weights. We define differential operators on tensor spaces of binary forms, which play the same role as the transvectant for binary forms. These operators enable us to find a set of algebraic invariants which parametrize the isomorphism classes of non-hyperelliptic curves of genus 4.