Some remarks on the hyperelliptic moduli of genus three

Tony Shaska,
Oakland University

Abstract. In 1967, Shioda determined the ring of invariants of binary octavics and their syzygies using the symbolic method. We discover that the syzygies determined by Shioda are incorrect. In this talk, we compute the correct equations among the invariants of the binary octavics and give necessary and sufficient conditions for two genus 3 hyperelliptic curves to be isomorphic over an algebraically closed field $k$, of characteristic different from 2, 3, 5, 7. For the first time, an explicit equation of the hyperelliptic moduli for genus 3 is computed in terms of absolute invariants. The talk will be accessible to a general audience.