

COLLOQUIUM

DEPARTMENT OF MATHEMATICS AND STATISTICS
OAKLAND UNIVERSITY
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Hyperelliptic Curves with Elliptic Involutions

Abstract: The locus \mathcal{L}_g of such genus g hyperelliptic curves is a g -dimensional subvariety of the moduli space of hyperelliptic curves \mathcal{H}_g . We discover a birational parametrization of \mathcal{L}_g via dihedral invariants and show how these invariants can be used to determine the field of moduli of points p in \mathcal{L}_g . We conjecture that for p in \mathcal{H}_g with $|\text{Aut}(p)| > 2$ the field of moduli is a field of definition and prove this conjecture for any point p in \mathcal{L}_g such that the Klein 4-group is embedded in the reduced automorphism group of p . Further, for $g = 3$ we show that for every moduli point p in \mathcal{H}_3 such that $|\text{Aut}(p)| > 4$, the field of moduli is a field of definition and provide a rational model of the curve over its field of moduli. Some applications of dihedral invariants in coding theory and computational algebraic geometry will be discussed.

372 Science and Engineering Building
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1:45-2:45 p.m.

Tony Shaska received his Ph.D. in mathematics from the University of Florida in 2001. He is a candidate for an assistant professorship at Oakland University.