

Department of Mathematics, BGU

Jerusalem - Be'er Sheva Algebraic Geometry Seminar

On Wednesday, December ,30 2020

At 15:00 – 16:30

In

Padmavathi Srinivasan (University of Georgia)

will talk about

Some Galois cohomology classes arising from the fundamental group of a curve

Abstract: We will talk about a few Galois cohomology classes naturally arising from the fundamental group of a curve.

We will first talk about the Ceresa class, which is the image under a cycle class map of a canonical algebraic cycle associated to a curve in its Jacobian. This class vanishes for all hyperelliptic curves and was expected to be nonvanishing for non-hyperelliptic curves. In joint work with Dean Bisogno, Wanlin Li and Daniel Litt, we construct a non-hyperelliptic genus 3 quotient of the Fricke-Macbeath curve with vanishing Ceresa class, using the character theory of the automorphism group of the curve, namely, $\mathrm{PSL}_2(\mathbb{F}_8)$.

In joint work with Wanlin Li, Daniel Litt and Nick Salter, we study two Galois cohomology classes (one abelian and one non-abelian), that obstruct the existence of rational points on curves, by obstructing splittings to natural exact sequences coming from the fundamental groups of a curve. An analysis of the degeneration of these classes at the boundary of the moduli space of curves, combined with a specialization argument lets us produce infinitely many curves of each genus over p -adic fields and number fields that have no rational points, explained by the nonvanishing of these obstruction classes. Our arguments give a new proof of Grothendieck's section conjecture for the generic curve of genus $g < 2$.