Speaker: Edgar Costa

Title: Effective obstruction to lifting algebraic classes from positive characteristic

Abstract: We will present two methods to compute upper bounds on the number of algebraic cycles that lift from characteristic p to characteristic zero. For an abelian variety, we show that we can recover the decomposition of its endomorphism algebra from two well-chosen Frobenius polynomials. We then focus on how to obtain similar bounds by relying on a single prime reduction, and instead consider p-adic thickenings. More precisely, we show how to compute a p-adic approximation of the obstruction map on the algebraic classes of a finite reduction for an abelian variety or a smooth hypersurface. This gives an upper bound on the "middle Picard number" of a hypersurface or similarly an upper bound on the endomorphism algebra or the Neron-Severi group of an abelian variety.

This is joint work with: Davide Lombardo, Nicolas Mascot, Jeroen Sijsling, Emre Sertz, and John Voight.