Abelian varieties & Galois actions

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ABSTRACTS

Speaker : Davide Lombardo
Title : *Galois representations attached to abelian varieties: effective aspects*
Abstract: Let A be an abelian variety defined over a number field K. To A/K one can canonically attach a family (ρ_ℓ) of ℓ-adic Galois representations, which have long been known to carry significant arithmetic information about A. Under various combinations of hypotheses concerning the dimension and the endomorphism algebra of A, results of Serre, Pink, Ribet, and others show that – for every ℓ – the image G_ℓ of ρ_ℓ is open in $\mathrm{MT}(A)(\mathbb{Z}_\ell)$, where $\mathrm{MT}(A)$ is the Mumford-Tate group of A. This gives a description of G_ℓ "up to finite index", and in many cases one even knows that the equality $G_\ell = \mathrm{MT}(A)(\mathbb{Z}_\ell)$ holds for all sufficiently large primes ℓ. In this talk I will consider the problem of making such results *effective*, giving for example an explicit value $B(A/K)$ – expressed as a simple function of A and K – such that the equality $G_\ell = \mathrm{MT}(A)(\mathbb{Z}_\ell)$ holds for all $\ell > B(A/K)$.