THE UNIVERSITY  OF HONG KONG

Department of Mathematics

C O L L O Q U I U M

Maximality of Galois actions for abelian varieties

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Abstract

Let X be a non-CM elliptic curve defined over a number field K and V_ℓ be the degree one ℓ-adic cohomology of X. A famous theorem of Jean-Pierre Serre in 1972 states that if ℓ is sufficiently large, then the image of the ℓ-adic Galois representation $\rho_\ell : \mathrm{Gal}(\overline{K}/K) \to \mathrm{GL}(V_\ell) \cong \mathrm{GL}_2(\mathbb{Q}_\ell)$ is as large as possible, that is, isomorphic to $\mathrm{GL}_2(\mathbb{Z}_\ell)$. We establish certain purely group-theoretic criteria to generalize Serre's theorem to proper smooth varieties. As a result, we obtain Galois maximality theorems for abelian varieties and K3 surfaces defined over fields that are finitely generated over $\mathbb{Q}$. This is a joint work with Michael Larsen.

Date:	**January 8, 2019 (Tuesday)**
Time:	**3:30 – 4:30pm**
Venue:	**Room 210, Run Run Shaw Bldg., HKU**

All are welcome