

ALGEBRA AND NUMBER THEORY
SEMINAR

Abelian varieties with big monodromy

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Abstract: Serre proved in 1972 that the image of the adelic Galois representation associated to an elliptic curve E without complex multiplication has open image; moreover, he also proved that for an elliptic curve over \mathbb{Q} the index of the image is always divisible by 2 (and in particular never surjective). More recently, Greicius in his thesis gave criteria for surjectivity and gave an explicit example of an elliptic curve E over a number field K with surjective adelic representation. Soon after, Zywina, building on earlier work of Duke, Jones, and others, proved that the adelic image ‘random’ elliptic curve is maximal.

In this talk I will explain recent work with David Zywina in which we generalize these theorems and prove that a random abelian variety in a family with big monodromy has maximal image of Galois. I’ll explain the analytic and geometric techniques used in previous work and the new geometric ideas – in particular, Nori’s method of semistable approximation– needed to generalize to higher dimension.

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