

## **abstract**

JOINT IAS/PU NUMBER THEORY SEMINAR

Topic:

Speaker:

Affiliation:

Date:

Time/Room:

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If  $K$  is the rational function field  $K=\mathbb{Q}(t)$ , then a polynomial  $f$  in  $K[x]$  can be regarded as a one-parameter family of polynomials. If  $f$  is irreducible, then a basic form of Hilbert's irreducibility theorem states that there are infinitely many parameters in  $\mathbb{Q}$  for which the corresponding polynomial is also irreducible. Moreover, if one exploits conjectures of Mordell and Lang (proved by Faltings) one can frequently prove stronger statements, e.g. that there are only finitely many reducible specializations where the parameter lies in a quadratic extension of  $\mathbb{Q}$ .

In this talk we will introduce an analogous theorem for an abelian variety  $A/K$  regarded as a one-parameter family of abelian varieties. More precisely, if  $A$  is (geometrically) simple and non-isotrivial over  $K$ , we will sketch an argument which shows that there are only finitely many parameters defined over a number field of bounded degree for which the corresponding abelian variety is not simple. Faltings' theorems again play a key role, but as we will explain, recent advances in expander graphs play a significant role as well.