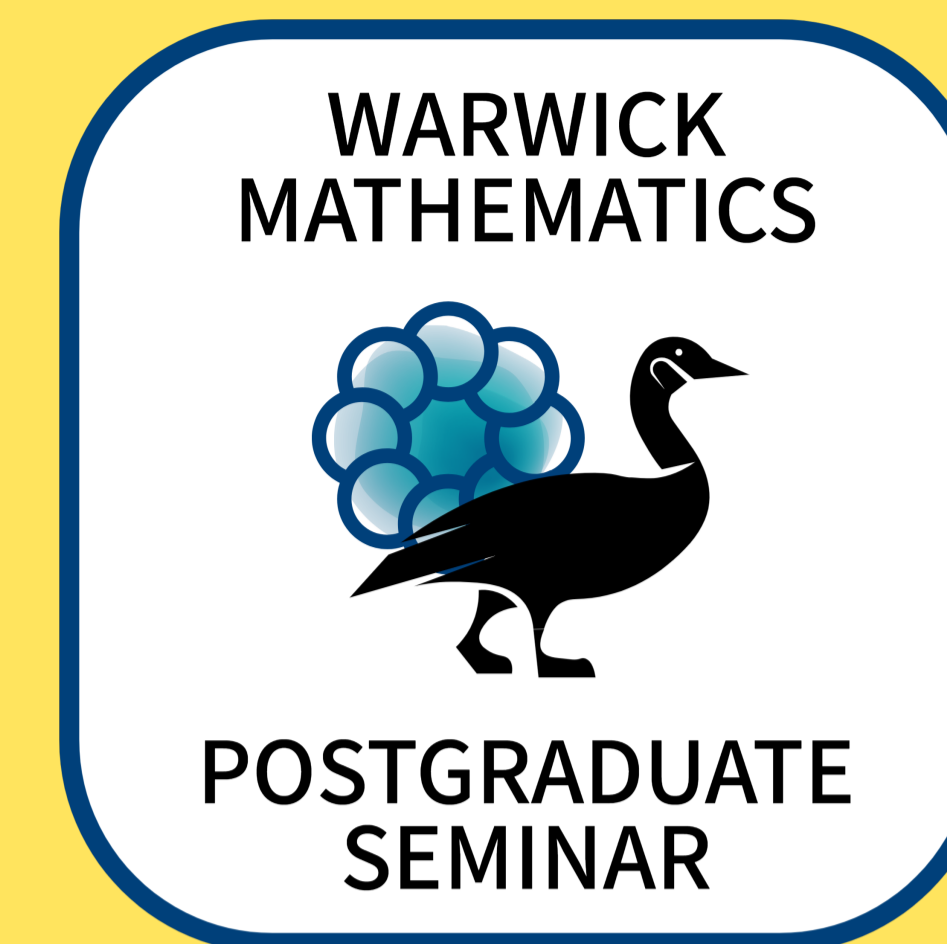


# Galois representations attached to elliptic curves and the Open Image Theorem

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Week 8 - Term 1



## Abstract

A Galois representation is a homomorphism  $\rho : \text{Gal}(\overline{K}/K) \longrightarrow \text{Aut}(V)$  where  $V$  is a finite dimensional vector space or a free module of finite rank. These objects are of great importance in number theory due to their connections with elliptic curves, modular forms and  $L$ -functions.

We will introduce the mod- $\ell$ ,  $\ell$ -adic and adelic Galois representations attached to a non-CM elliptic curve and discuss the structure of their image. The  $\ell$ -adic open image does not a priori imply the adelic open image but as we will see, it all boils down to the surjectivity of the more innocent sounding mod- $\ell$  representation.

### Time

12 pm, 23<sup>rd</sup>  
November 2022

### Location

Room B3.02

### Organisers

Alvaro Gonzalez Hernandez  
Katerina Santicola