Title: Serre’s uniformity problem via modular curves

Abstract: I will discuss Serre’s uniformity problem over \( \mathbb{Q} \), an open problem in the theory of Galois representations of elliptic curves. Past work by Serre, Mazur and Bilu-Parent has led to important progress but has not solved the problem. The remaining and most difficult part amounts to a problem concerning rational points of modular curves associated to normalizers of non-split Cartan subgroups. I will discuss this case and also introduce my work on these modular curves. This includes an exceptional isomorphism which can be constructed in two different ways.