**ERNST KANI**, Queen's University

*Tensor Products of Galois Representations*

Let $\rho_{A_i,\ell} : G_K \to \mathsf{Aut}(V_\ell(A_i))$ be the $\ell$-adic Galois representation attached to an abelian variety $A_i/K$, and let $\tau_{A_i,\ell}$ : $\mathsf{End}(A_i) \otimes \mathbb{Q}_\ell \xrightarrow{\sim} \mathsf{End}_{\mathbb{Q}_\ell[G_K]}(V_\ell(A_i))$ be the canonical isomorphism (Tate/Faltings). The purpose of this talk is to study properties of the tensor product $\rho_{A_1,\ell} \otimes \rho_{A_2,\ell}$ of two such representations, particularly in view of the following question: when is $\tau_{A_1,\ell} \otimes \tau_{A_2,\ell}$ : $\mathsf{End}(A_1) \otimes \mathsf{End}(A_2) \otimes \mathbb{Q}_\ell \to \mathsf{End}_{\mathbb{Q}_\ell[G_K]}(V_\ell(A_1) \otimes V_\ell(A_2))$ an isomorphism? (This question is related to Tate's Conjecture for codimension 2 cycles on products of abelian varieties.) In this talk I will give a solution in the case when $K = \mathbb{Q}$ and $A_i = A_{f_i}$ is a modular abelian variety attached to a weight 2 newform $f_i$ on $\Gamma_1(N_i)$. If time permits, I will also discuss mod $\ell$ analogues.