1145-14-2391   **Sarah Frei*** (`sfrei@uoregon.edu`). *Galois representations of moduli spaces of sheaves.*
We will study moduli spaces of stable sheaves on K3 surfaces defined over an arbitrary field. While these varieties have been studied extensively over the complex numbers, they have only recently been studied more thoroughly over other fields and were used by Charles to prove the Tate conjecture for K3 surfaces over finite fields. In this talk, we will discuss the cohomology groups of the moduli spaces as Galois representations. Our main result is that for any two K3 surfaces, a Galois equivariant isomorphism between their etale cohomology groups implies an isomorphism as Galois representations between the cohomology groups of moduli spaces of stable sheaves on each of equal dimension. In particular, when the K3 surfaces are defined over a finite field, this implies that the moduli spaces have the same zeta functions. (Received September 25, 2018)