Oklahoma State University

Number Theory Seminar

Title

Lifts of Mod p Reducible Galois Representations

Speaker: Anwesh Ray, Cornell
Date: Oct 9, 2018
Time: 3:30 PM
Room: MSCS 445

Abstract: A Galois representation is (from the perspective and scope of this talk) a continuous p-adic representation of the absolute Galois group of the field of rational numbers. Eigenforms and motives are natural sources for Galois representations, such Galois representations are of central importance in number theory and share some key abstract properties. Since Wiles et al, many sophisticated new techniques have been implemented to show in great generality that Galois representations with suitable properties can be shown to arise from modular/automorphic forms.
Serre's Modularity Lifting conjecture, which is now the celebrated theorem of Khare and Wintenberger, predicts when two-dimensional irreducible mod p representation may lift to a modular one. Hamblen and Ramakrishna generalize Khare and Wintenberger's result to two dimensional reducible (and non-semisimple) mod p Galois representations (without being able to optimize the level of the lift). Such mod p representations are abundant and arise naturally from class group data, this is what makes their deformation theory so fascinating. I will outline some generalizations and complements of their result and some potential future directions.