

Speaker: Luis Garcia

Title: Special cycles on Shimura varieties and their local archimedean heights

Abstract: Shimura varieties of orthogonal and unitary groups have a rich collection of subvarieties known as special cycles. In the 1980's Kudla and Millson showed that the generating functions that can be constructed using special cycles are modular forms. Their proof involves constructing explicit differential forms that are Poincare dual to these cycles. I will describe a different approach to defining these differential forms that uses Quillen's notion of superconnection and takes advantage of theorems of Bismut, Gillet and Soule, leading to simpler proofs of these modularity results.

After that I will discuss Kudla's arithmetic Siegel-Weil conjecture relating derivatives of Eisenstein series and heights of special cycles. I will describe recent joint work with Siddarth Sankaran that uses the above ideas to define natural Green currents for special cycles and compute their local archimedean heights, settling part of Kudla's conjecture.