Speaker: Jacob Tsimerman

Title: Bounding torsion in class group and families of local systems

Abstract: (joint w/ Arul Shankar) We discuss a new method to bound 5-torsion in class groups of quadratic fields using the refined BSD conjecture for elliptic curves. The most natural trivial bound on the n-torsion is to bound it by the size of the entire class group, for which one has a global class number formula. We explain how to make sense of the n-torsion of a class group intrinsically as a selmer group of a Galois module. We may then similarly bound its size by the Tate-Shafarevich group of an appropriate elliptic curve, which we can bound using the BSD conjecture. This fits into a general paradigm where one bounds selmer groups of finite Galois modules by embedding into global objects, and using class number formulas. If time permits, we explain how the function field picture yields unconditional results and suggests further generalizations.