BOSTON UNIVERSITY NUMBER THEORY SEMINAR

Isogeny classes of principally polarized abelian varieties, orbital integrals, and the Steinberg-Hitchin base

S. Ali Altuğ
Boston University

Monday, November 26 at 4:15 pm
111 Cummington Mall, MCS B21
Tea and cookies in MCS 144 at 4:00 pm

Abstract: The Steinberg-Hitchin base (SH-base) is the generalization of the space of characteristic polynomials for $GL(n)$ to general reductive algebraic groups G. In particular, it classifies the semisimple stable conjugacy classes of the group, that is to say conjugacy over (separable) algebraic closure. It is a natural object in the study of (stable) orbital integrals and the trace formula, which are basic ingredients of the arithmetic and harmonic analysis of locally symmetric spaces and, in particular, Shimura varieties.

In this talk I will report on the recent (partially ongoing) work joint w/ Achter, Garcia, and Gordon, where we investigate the number of members in an isogeny class of an ordinary principally polarized abelian variety of genus g over a finite field $\mathbb{F}_q$. Following Gekeler ('2003), I will describe a simple probabilistic model for the count for $g = 1$ and describe how it gives the correct number, by first relating the counts to certain orbital integrals (via Langlands-Kottwitz) and then relating the orbital integrals to the model (by essentially a change of variables on the SH-base). I will then describe the problem for general genus and the extra ingredients that go into the count.