

Anna Medvedovsky, Boston University

Title: *Deep congruences between same-weight eigenforms*

Abstract: There are lots of deep p -power congruences between classical eigenforms of different weights, as witnessed by p -adic families. But what about deep congruences in the same weight? Recent computations of Andrea Conti and Peter Gräf suggest that there are in fact lots of these as well, between p -new forms with opposite Atkin-Lehner-at- p sign.

This talk will report on progress towards establishing such same-weight congruences. I expect to prove that the characteristic polynomials of Hecke action on the Atkin-Lehner plus/minus subspaces are congruent, up to a correction term coming from low weight, modulo a power of p that tends to infinity as k grows. The method of proof – the trace formula combined with an algebra lemma relating congruences between power-sum and elementary symmetric functions – was developed in a recent collaboration with Samuele Anni and Alexandru Ghitza to count eigenforms split up by mod- p eigensystem and Atkin-Lehner sign; I will describe this latter application as well.