

**Title:** Fluctuations in the distribution of Hecke eigenvalues

**Abstract:** A famous conjecture of Sato and Tate (now a celebrated theorem of Taylor et al) predicts that the normalised  $p$ -th Fourier coefficients of a non-CM Hecke eigenform follow the semicircle distribution as we vary the primes  $p$ . In 1997, Serre obtained a distribution law for the vertical analogue of the Sato-Tate family, where one fixes a prime  $p$  and considers the family of  $p$ -th coefficients of Hecke eigenforms. In this talk, we address a situation in which we vary the primes as well as families of Hecke eigenforms. In 2006, Nagoshi obtained distribution measures for Fourier coefficients of Hecke eigenforms in these families. We consider another quantity, namely the number of primes  $p$  for which the  $p$ -th Fourier coefficient of a Hecke eigenform lies in a fixed interval  $I$ . On averaging over families of Hecke eigenforms, we obtain a conditional central limit theorem for this quantity. This is joint work with Kaneenika Sinha.