

**Speaker:** Sonal Jain

**Title:** Modelling  $\lambda$ -invariants by  $p$ -adic random matrices

**Abstract:** The  $\lambda$ -invariant is an invariant of an imaginary quadratic field that measures the growth of class numbers in cyclotomic towers over the field. It also measures the number of zeroes of an associated  $p$ -adic  $L$ -function. In this talk, I will discuss the following question: How often is the  $p$ -adic  $\lambda$ -invariant of an imaginary quadratic field equal to  $m$ ? I'll explain how one can model this question by statistics of  $p$ -adic random matrices, and show one can test this model by computing  $\lambda$ -invariants rapidly. I will also discuss some recent progress on modelling more refined features of these  $p$ -adic  $L$ -function by means of  $p$ -adic random matrices. This is joint work with Jordan Ellenberg and Akshay Venkatesh.