SPEAKER: Olivia Beckwith (Univ. of Bristol, UK)

TITLE: Indivisibility and divisibility of class numbers of imaginary quadratic fields

ABSTRACT: For any prime $p > 3$, the strongest lower bounds for the number of imaginary quadratic fields with discriminant down to $-X$ for which the class group has trivial (resp. non-trivial) p-torsion are due to Kohnen and Ono (Soundararajan). I will discuss refinements of these classic results in which we consider the imaginary quadratic fields for which the class number is indivisible (divisible) by p and which satisfy the property that a given finite set of rational primes split in a prescribed way. We prove a lower bound for the number of such fields with discriminant down to $-X$ which is of the same order of magnitude as in Kohnen and Ono's (Soundararajan's) results. For the indivisibility case, we rely on a result of Wiles establishing the existence of imaginary quadratic fields with trivial p-torsion in their class groups which satisfy a finite set of local conditions, and a result of Zagier which says that the Hurwitz class numbers are the Fourier coefficients of a mock modular form.