THE UNIVERSITY OF HONG KONG

Institute of Mathematical Research
Department of Mathematics

NUMBER THEORY SEMINAR

Moments of Hurwitz Class Numbers in arithmetic progressions

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Abstract

The classical Hurwitz relation gives us the $\sum_t H(4p - t^2) = 2p$. This motivates the search for generalised formulas where t is restricted to a specific residue class mod M and weighted by some power of t. The paper "Sums of class numbers and mixed modular forms" investigates this question for $M = 3$. In the first part of the talk, we introduce this original problem and the techniques used to solve it for this specific modulus, including Zagier's Mock Modular series, Rankin-Cohen brackets, theta functions and holomorphic projection. In the second half, we extend these methods to $M = 5$ and $M = 7$ using eta quotients and newform decomposition, presenting the explicit formulas obtained. Finally, we discuss our expectations for general primes and outline the remaining technical obstacles to a general proof.

Date:	November 20, 2026 (Friday)
Time:	2:00 pm – 3:00 pm
Venue:	Room 210, Run Run Shaw Building HKU

All are welcome