

HKU Algebra and Number Theory Seminar

Ben Kane

The University of Hong Kong

Friday, May 3, 2024

Run Run Shaw Building, room 210

Title: Explicit Class number formulas for Siegel–Weil averages of ternary quadratic forms

Abstract: In this talk, we consider representations of integers via positive-definite integral ternary (three-variable) quadratic forms. The so-called Siegel–Weil average of the representations over the genus, coming from the local information about the quadratic form, gives the Eisenstein series component of the corresponding theta function and gives the main asymptotic term of the number of representations by the quadratic form. We investigate the genus average of the number of representations in this talk. Building off of Gauss’s investigation of the case $Q(x, y, z) = x^2 + y^2 + z^2$, it has been shown that this average of the solutions $Q(x, y, z) = n$ is related to class numbers of imaginary quadratic orders contained in $\mathbb{Q}(\sqrt{-n})$, which were made explicit by Jones when n is relatively prime to the discriminant of Q . We extend this to get explicit formulas in all cases. This is based on two papers, one joint with Kathrin Bringmann and one joint with Daejun Kim and Srimathi Varadharajan.