RIGOROUS COMPUTATION OF CM STRUCTURE ON K3 SURFACES

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Time: Thu, May 13th, 15:15 - 15:45
Venue: Room 102, SCMS

Abstract:

The K3 surfaces endowed with CM structure have many nice properties: Hodge conjecture on self-product of such surfaces are proven to be true, and Coleman’s conjecture in this case is also proven to be true. However, due to technical limitations, we cannot directly verify the CM structure through computation, which is essentially because computers lack the capacity to process real numbers.

This research project makes use of the theories of CM abelian varieties and Mumford-Tate group representations, and transforms this problem into a computable one. Through the eigenvalue trick discovered by the speaker, we can transform the computation on the transcendental lattice into a computation of Hecke Grosssecharaktre, which is better documented and feasible with current technology.