ICTS Lecture Series

Title : Arithmetic Geometry and Quantum Field Theory

Speaker : Minhyong Kim (University of Edinburgh, UK)

Date : 03rd September to 6th September 2024

Time : 3:00 PM (IST)

Abstract : In the 1960's Barry Mazur called attention to an 'analogy between knots and primes', in terms of which he conceptualised the Main Conjecture of Iwasawa Theory relating p-adic L-functions and ideal class groups. This analogy led his research away from topology and into number theory, after which he went on to prove the Main Conjecture with Andrew Wiles about 20 years later. In this series of lectures, we will recast this story as an analogy between Wilson loop operators and Frobenius trace operators, which itself sits inside a framework of arithmetic topological quantum field theory. In particular, we will see how class field theory can be used to define arithmetic action functionals and compute simple arithmetic path integrals. Using this formalism, we will speculate about the possibility of constructing key invariants of number theory such as L-functions using ideas from quantum field theory.

Venue : Feynman Lecture Hall

Zoom Link: https://icts-res-in.zoom.us/j/91905419167?pwd=LUJKVoo9dYyyZw7JjTlRN9yMxDOnmL.1
Meeting ID: 919 0541 9167
Passcode: 404030