ICTS Colloquium

Title : Sphere packing, energy minimization, and modular forms

Speaker : Abhinav Kumar, Stony Brook University, New York

Date : Monday, March 11, 2019

Time : 3:00 PM

Venue : Emmy Noether Seminar Room, ICTS Campus, Bangalore

Abstract : In 2016 Viazovska settled the sphere packing problem in 8 dimensions, showing that the E8 lattice gives the densest packing. The key new ingredient in her stunningly elegant proof was the use of modular forms. Shortly afterwards, the Leech lattice was shown to be the densest packing in 24 dimensions, with a similar proof. Recently, we(Cohn-Kumar-Miller-Radchenko-Viazovska) have put these methods into a broader framework, using modular forms to derive new interpolation formulae for radial Schwartz functions and show that E8 and the Leech lattice are universally optimal - they minimize energy in their respective dimensions for a large class of potential functions. I will describe highlights and key ideas of these results.