

Speaker: Alex Kontorovich

Title: The Arithmetic of Kleinian Sphere Packings

Abstract: In recent work with Kei Nakamura, we studied interactions of geometry and arithmetic of so-called Crystallographic Sphere Packings, that is, ones which arise as limit sets of finitely-generated reflection groups acting on hyperbolic space. Of special interest are the "superintegral" such, a quintessential example being the classical Apollonian Circle Packing; for these, there are general Local-Global Conjectures on the arising bend sets. While all previously known superintegral packings were crystallographic (that is, generated by reflections), in joint work with M. Kapovich we construct new superintegral "Kleinian" sphere packings, not falling under the purview of the crystallographic theory. We also prove the Non-Uniformity Conjecture: an arithmetic hyperbolic lattice is commensurate to the supergroup of a Kleinian sphere packing if and only if it is non-uniform. ?