
* UCLA Combinatorics Seminar *

Date: Thursday, May 5, 1.50-2.50 in Room 5217

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On minimal lattice spherical configurations in three dimensions

Abstract

The kissing number problem asks for the maximal number of non-overlapping unit balls in R^n that touch another unit ball. The answer is only known in dimensions 1,2,3,4,8,24. In fact, in dimension 3 this was the subject of a famous argument between Isaac Newton and David Gregory, which was only settled in 1953. The kissing number problem can be reformulated as follows: find the maximal configuration of points on the unit sphere in R^n such that the angular separation between any pair of these points is at least $\pi/3$. Such configurations are usually expected to come from sets of minimal vectors of lattices, at least this is the case in all known dimensions. This consideration raises the following natural related question: given a spherical lattice triangle, what is the minimal possible spherical area (i.e. measure of the corresponding solid angle) it can have? In this talk, I will give at least a partial answer to this question in dimension three.

This is joint work with Sinai Robins.