

Michigan Math Club

Thursday at 4pm in the Commons

Free Pizza and Pop

The E_8 -Lattice, the Leech Lattice and Beyond

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Abstract for 21 October 2010

In this elementary talk, we introduce basics about rational lattices and give examples. Some lattices are really good ones, notably the E_8 -lattice in dimension 8 and the Leech lattice in dimension 24. Both have remarkable finite isometry groups and give sphere packings of remarkably high minimum norms and high packing densities. Generalizations to higher dimensions have been considered, for example extremal lattices. A few months ago, a rank 72 extremal lattice was found, with nice connections to the Leech lattice (hint: $72 = 3$ times 24).

