BOSTON UNIVERSITY MATHEMATICS COLLOQUIUM

Apollonian circle packings and the Abelian sandpile

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Abstract: I will present joint work with Lionel Levine and Wesley Pegden. The Abelian sandpile is a simple, deterministic diffusion process on the integer lattice that was devised to model "self-organized criticality" by statistical physicists. A remarkable feature of this process is the beautiful fractal images it generates. The precise nature of these fractals was unknown until quite recently, when the scaling limit of the sandpile was identified. It turns out that the fractals are given by solutions of a degenerate elliptic partial differential equation which, surprisingly, has the structure of an Apollonian circle packing.

From 2:30-3:00 pm in MCS 148, there will be a pre-colloquium talk by Samuel Isaacson, "Introduction to the discrete Laplacian." There will be a tea from 3:30-4:00 pm in MCS 144.