

Circles in the Sand

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I will describe the role played by an Apollonian circle packing in the scaling limit of the abelian sandpile on the square grid \mathbb{Z}^2 . The sandpile solves a certain integer optimization problem. Associated to each circle in the packing is a locally optimal solution to that problem. Each locally optimal solution can be described by an infinite periodic pattern of sand, and the patterns associated to any four mutually tangent circles obey an analogue of the Descartes Circle Theorem. Joint work with Wesley Pegden and Charles Smart.