The bootstrap percolation cellular automaton

ABSTRACT

Cellular automaton models arise naturally in the study of a wide variety of physical systems. Such models have obvious mathematical appeal, and lend themselves naturally to computer simulation. However, rigorous analysis is often notoriously difficult. I will focus on bootstrap percolation - an very simple model which gives rise to a rich and often surprising rigorous theory. In particular I will discuss the recent proof that the metastability threshold for the model in two dimensions is $\pi^2/18$. The existence of such a threshold settles a conjecture of Aizenman and Lebowitz, while the numerical value corrects simulation predictions of Adler, Stauffer and Aharony.