

Department of Applied Mathematics and Statistics
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SEMINAR

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April 8, 2004
304 Whitehead Hall
Refreshments: 3:30 p.m.
Seminar: 4:00 p.m.

THEORY AND ALGORITHMS FOR FINDING THRESHOLDS
OF PERCOLATION

ABSTRACT

Percolation involves the creation of long-range connectivity in a graph, usually based upon a regular or random lattice. Exact results have been found for a limited number of two-dimensional lattices. Numerical methods of finding the threshold are based upon measuring crossing probabilities, cluster-size distributions, and other cluster properties, and to do these things a variety of numerical techniques have been devised. Here we discuss several of these techniques and discuss the advantages and disadvantages of each—and perhaps stimulate interest in finding improvements. (Some algorithms include the Hoshen–Kopelman and Newman–Ziff algorithms, hull methods, and Leath cluster growth.) We also discuss some theoretical considerations, such as the question of finite-size corrections that always go along with this type of work.