Physics 514 – Percolation Exercise

Emanuel Gull

Due 10:00 AM, Thursday October 19 2017

1 Percolation

- Make a square lattice and set the elements of the lattice to 1 with probability p and to 0 with probability $1 - p$.
- Identify all clusters on the lattice (i.e. all connected sites set to 1) using the Hoshen Kopelman algorithm. Choose $p \sim 0.58$ on a large lattice and make a plot, coloring the different clusters.
- compute the probability P of having a percolating cluster (one that has an element both on the bottom and on the top row of your lattice) as a function of p, make a plot of $P(p)$, and send plot, code, and descriptions to Canvas.

Homework Submission

Summarize your results and plots into one PDF file and also submit your codes to Canvas.