Physics 4488/6562: Statistical Mechanics
http://www.physics.cornell.edu/sethna/teaching/562/
Material for Week 14
Exercises due Mon May 6
Last correction at April 24, 2019, 12:52 pm
©2018, James Sethna, all rights reserved


Monday
In-class question: 12.7 Renormalization-group trajectories

Wednesday
Read: Chapter 12, Sec. 12.2 (Scale Invariance)
Pre-class question: 12.3 Scaling and coarsening
In-class question: 12.8 Superconductivity and the renormalization group

Friday
Read: Chapter 12, Sec. 12.3 (Examples of critical points)
Pre-class question: 12.23 Period doubling and the onset of chaos
In-class question: 12.18 Hysteresis and Barkhausen noise

Monday
Pre-class question: 12.19 Earthquakes and wires

Supplement
In-class question: 12.22 Diffusion equation and universal scaling functions
In-class question: 12.2 Scaling and corrections to scaling
In-class question: 12.4 Bifurcation theory
In-class question: 12.31 Nonlinear flows, analytic corrections, and hyperscaling
In-class question: 12.32 Beyond power laws: Nonlinear flows and logarithms in the 2D Ising model

Exercises
Those in 4488 may choose one of the three exercises (plus Monday’s pre-class).

12.9 Period doubling and the renormalization group. (Hints are available in Python and Mathematica: http://pages.physics.cornell.edu/~sethna/StatMech/ComputerExercises.html.)

The onset of chaos: Lowest-order renormalization-group for period doubling.

References