

Mini-Course on Phase Transitions and Ordering

(7 lectures with intervening interactive tutorials)

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Venue: A 304 Time: 2:30 pm

Lecture Dates: Feb 22, 24, 27
Mar 1, 3, 6, 8

Tutorials to be announced in class



OUTLINE of LECTURES

Ordered Phases and Phase Transitions: Phenomenology; Definitions; Models and Mappings

Mean Field Theory: Variational basis; Ornstein-Zernike Theory; Ginzburg Criterion

General Results on Ordering: Lower critical dimension; Peierls proof of ordering; Mermin-Wagner result on absence of ordering

Critical Phenomena: Fluctuations and their growth; Scaling; Universality

Renormalization Group: Basic idea; Block spins; Real-space RG

Time-dependent properties: Glauber and Kawasaki dynamics; Phase ordering kinetics

Ordered Phases out of Equilibrium: Nonequilibrium steady states and phase transitions; Fluctuation-dominated order