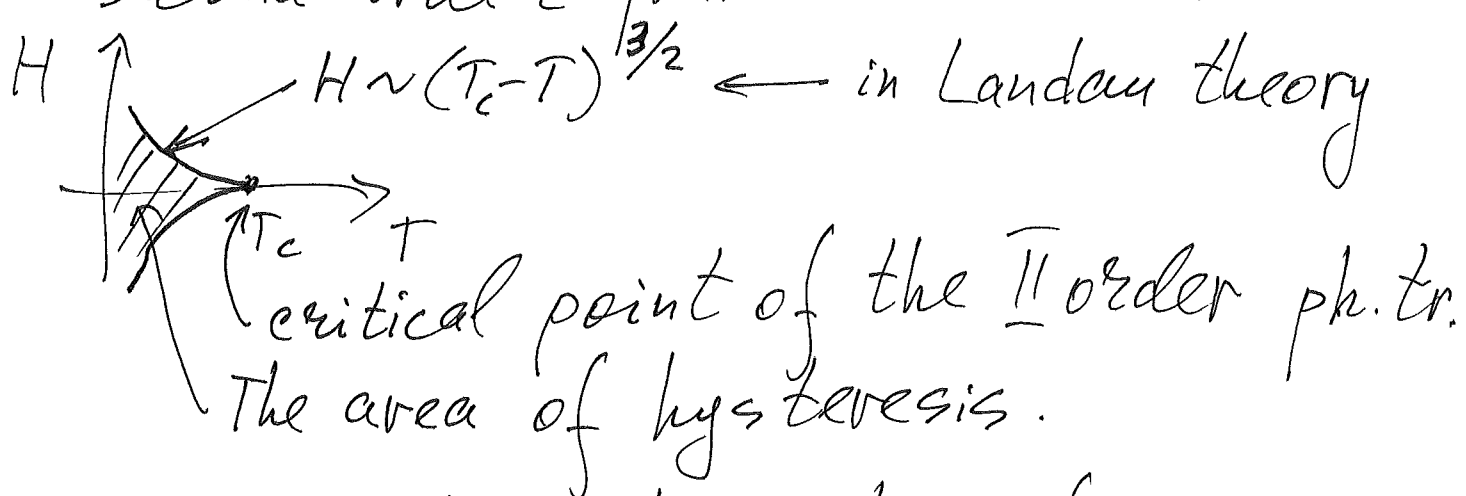


Lecture 9

Preliminary list of topics

- (1) The phase diagram (T, H) of a ferromagnetic material. $F(T, h) = \frac{a}{2} m^2 + \frac{b}{4} m^4 - mh$
 Relation between the first and the second order phase transitions.



- (2) I-order phase transition for
 $F(T) = \frac{a}{2} m^2 + \frac{b}{4} m^4 + \frac{c}{6} m^6$

the limiting metastable states, and the singularity of susceptibility at these points.

$\frac{1}{\sqrt{T^* - T}}$

- (3) Ginzburg-Landau ~~app~~ functional

$$\Phi[m(\vec{x}), T, h] = \int d^D x \left\{ \frac{c}{2} (\nabla m)^2 + \frac{a}{2} m^2 + \frac{b}{4} m^4 - hm \right\}$$

Correlation length in the Ginzburg-Landau theory: $\langle m(0) m(\vec{x}) \rangle \sim e^{-|\vec{x}|/\xi}$ $\xi \sim \frac{1}{\sqrt{|T - T_c|}}$