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HOD Physics

Superconductivity

MPHY CC-11

P. 4. Sem III (24.12)

[#] Zero Resistance

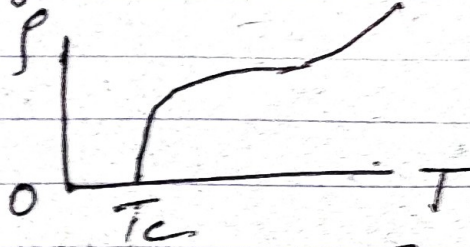


Fig. Resistivity versus Temperature T for a superconductor.

Onnes in 1911 first observed superconductivity in the course of his expts. on the electrical conductivity of metal at low temps. The transition at which the transition takes place is called the critical temp.

Below the critical temp. the state of matter was coined with the term superconductivity. Above T_c , the material becomes the familiar normal state. The resistivity of metal is written as

$$\rho = \frac{m}{ne^2\tau}$$

where τ is the collision time, and ρ decreases as T decreases, the lattice vibrations begin to "freeze" and hence the scattering of the electrons diminishes.