

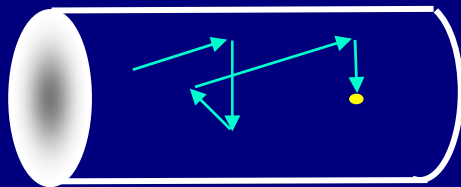
Superconductivity

1911: Kamerlingh-Onnes discovered that some metals at low temperature become perfect conductors. The resistance was lower than could be measured (still true today!).

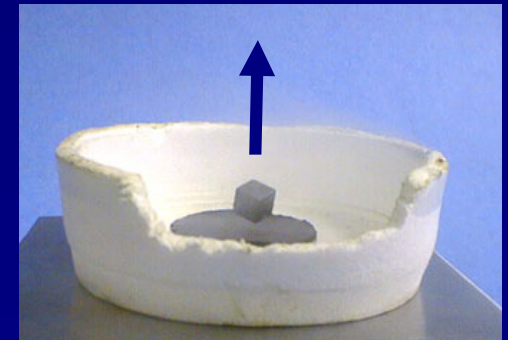
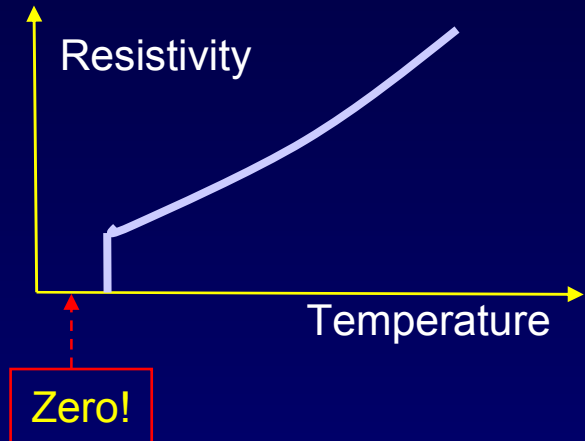
1933: Meissner discovered that superconductors expel a magnetic field. They can be levitated by the magnetic repulsion.

The physics in a (small) nutshell:

At low temperatures, the electrons in some materials (e.g., lead) develop an energy gap (not the band gap). This gap makes it impossible for electrons to scatter from impurities, because no states are available.



This does not happen in a superconductor.



Demo