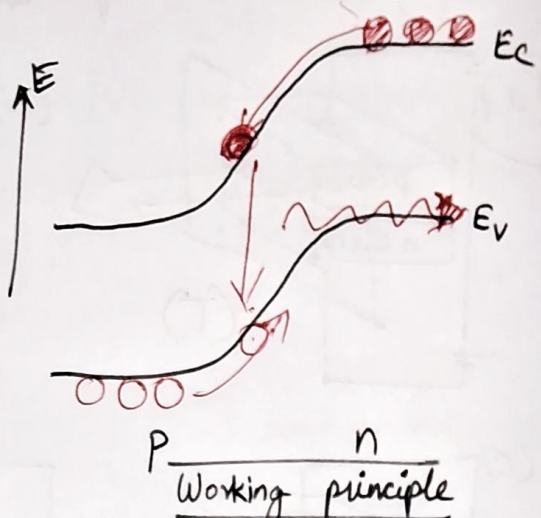
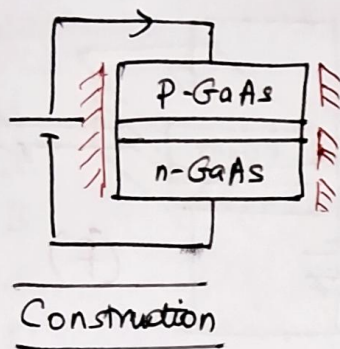


Diode laser



- Depletion region is the active medium
- Forward biasing is the pump
- Polished faces of the GaAs crystal serve as the optical resonator

Since the forward biasing populates the electrons in the ~~conductor~~ n region and holes in the p-region, when they meet at the depletion region, the active medium is already in the inverted state.

Therefore there is no need for a metastable state in a diode laser.

However, due to the shorter lifetime of radiative recombination, large threshold currents are required to initiate lasing action.

Heterojunction diode laser address the challenge of large threshold current. A heterojunction diode is a pn junction made with materials of different band gap. i.e. p region has one band gap and n region has ~~the~~ other band gap.