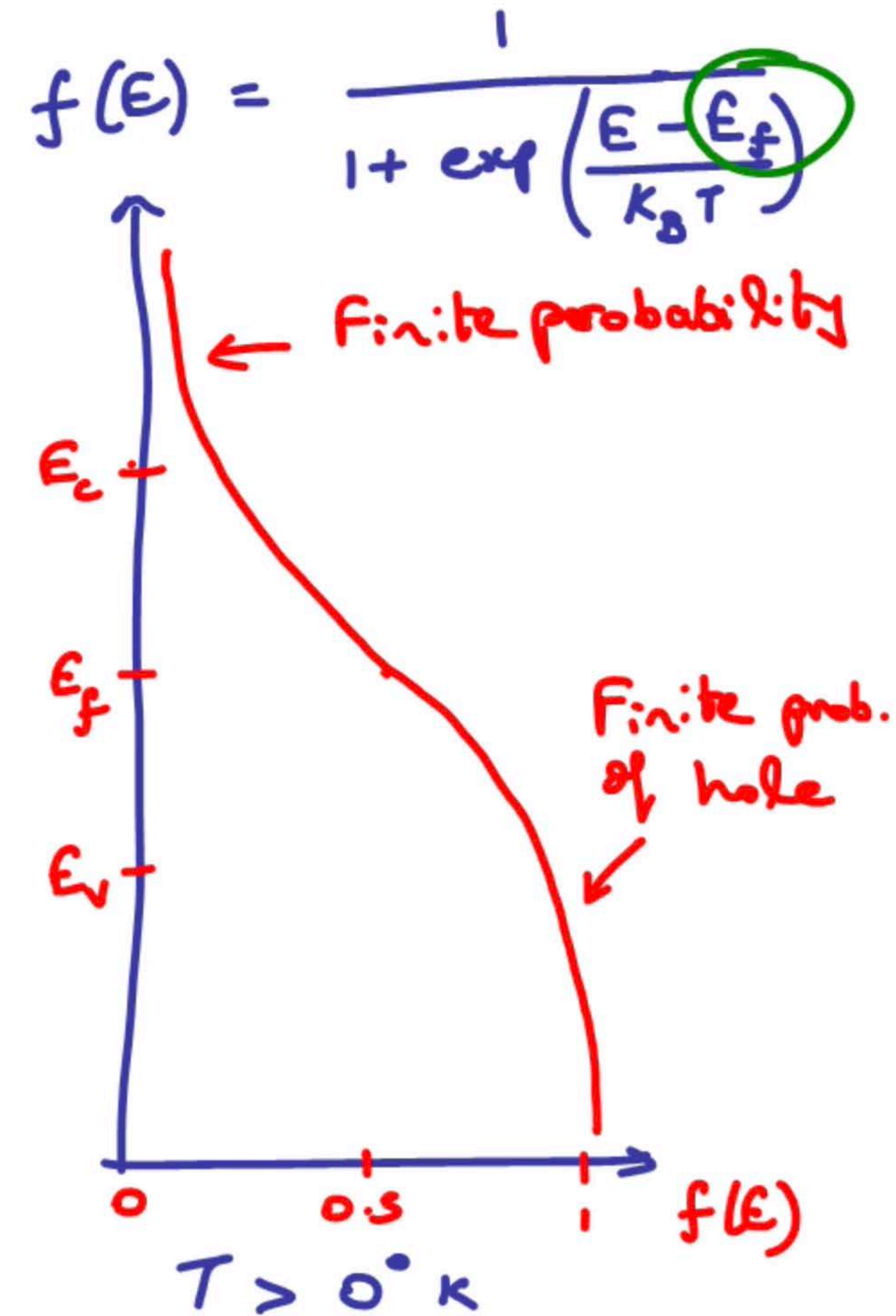
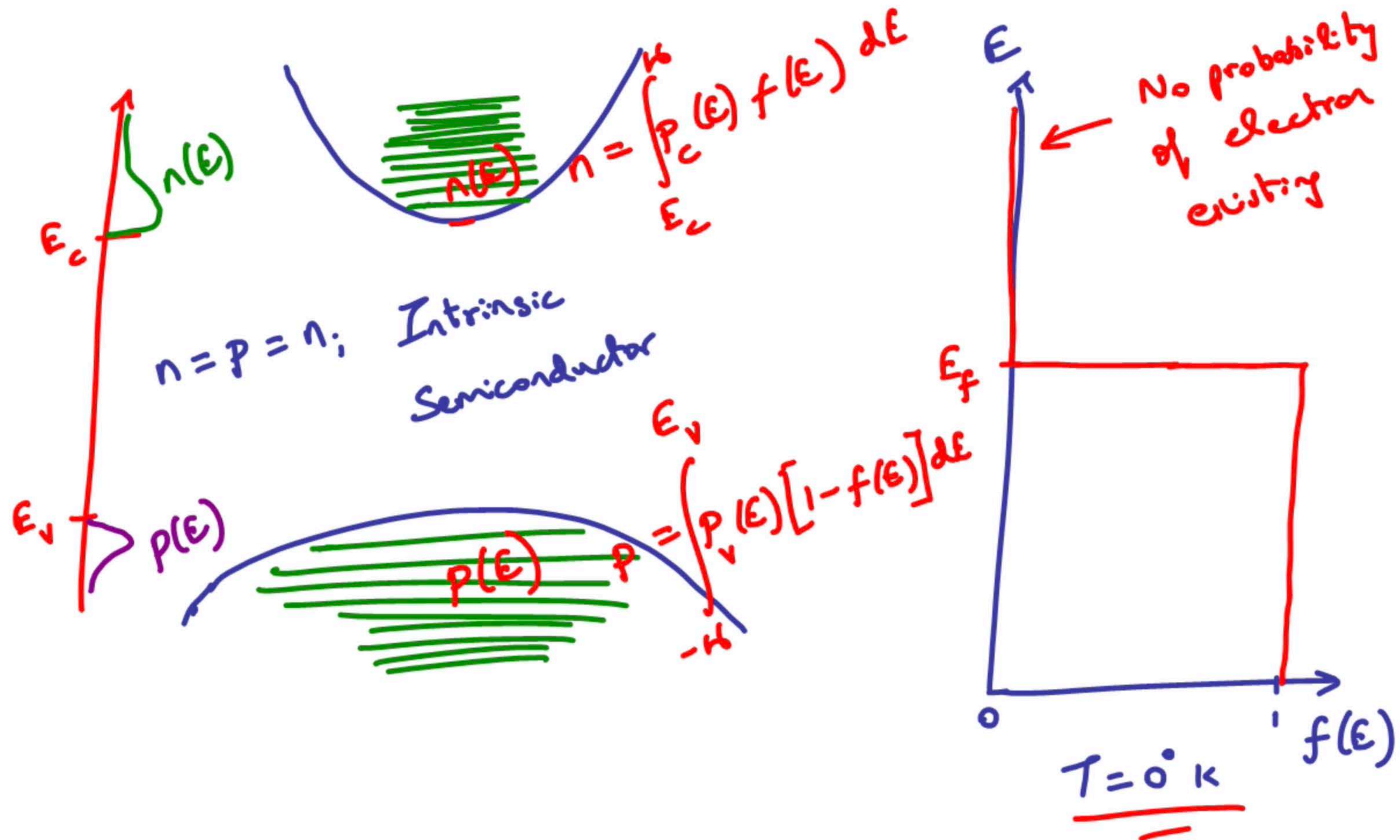


$$\begin{aligned}
 &P_c(E) \propto (E - E_c)^{1/2} \\
 &E_c \\
 &E_v \\
 &P_v(E) \propto (E_v - E)^{1/2}
 \end{aligned}$$

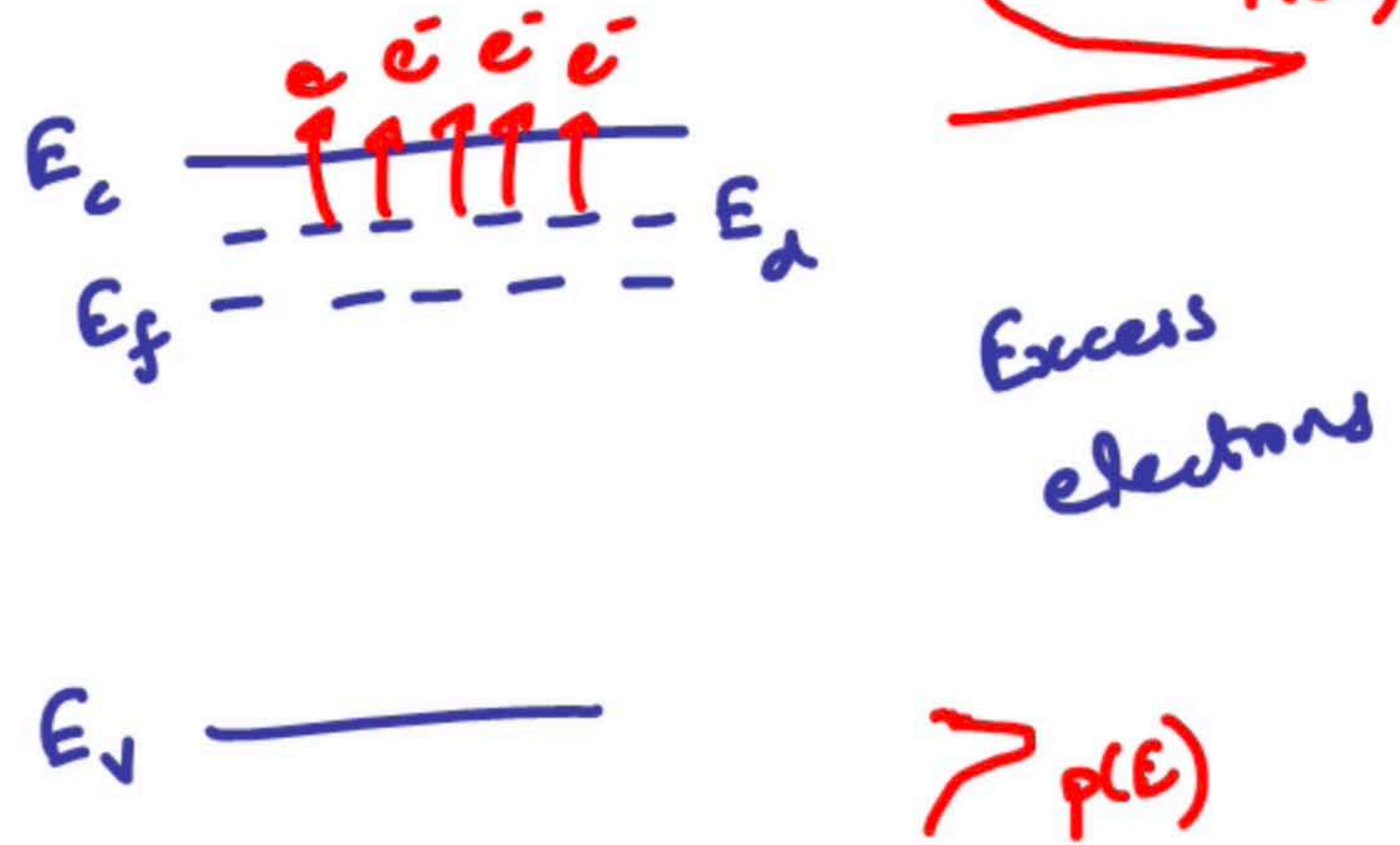
Density of states in
valence & conduction bands
is higher as we
move away from
bandgap

Probability of occupancy (electron) \rightarrow Fermi-Dirac distribution

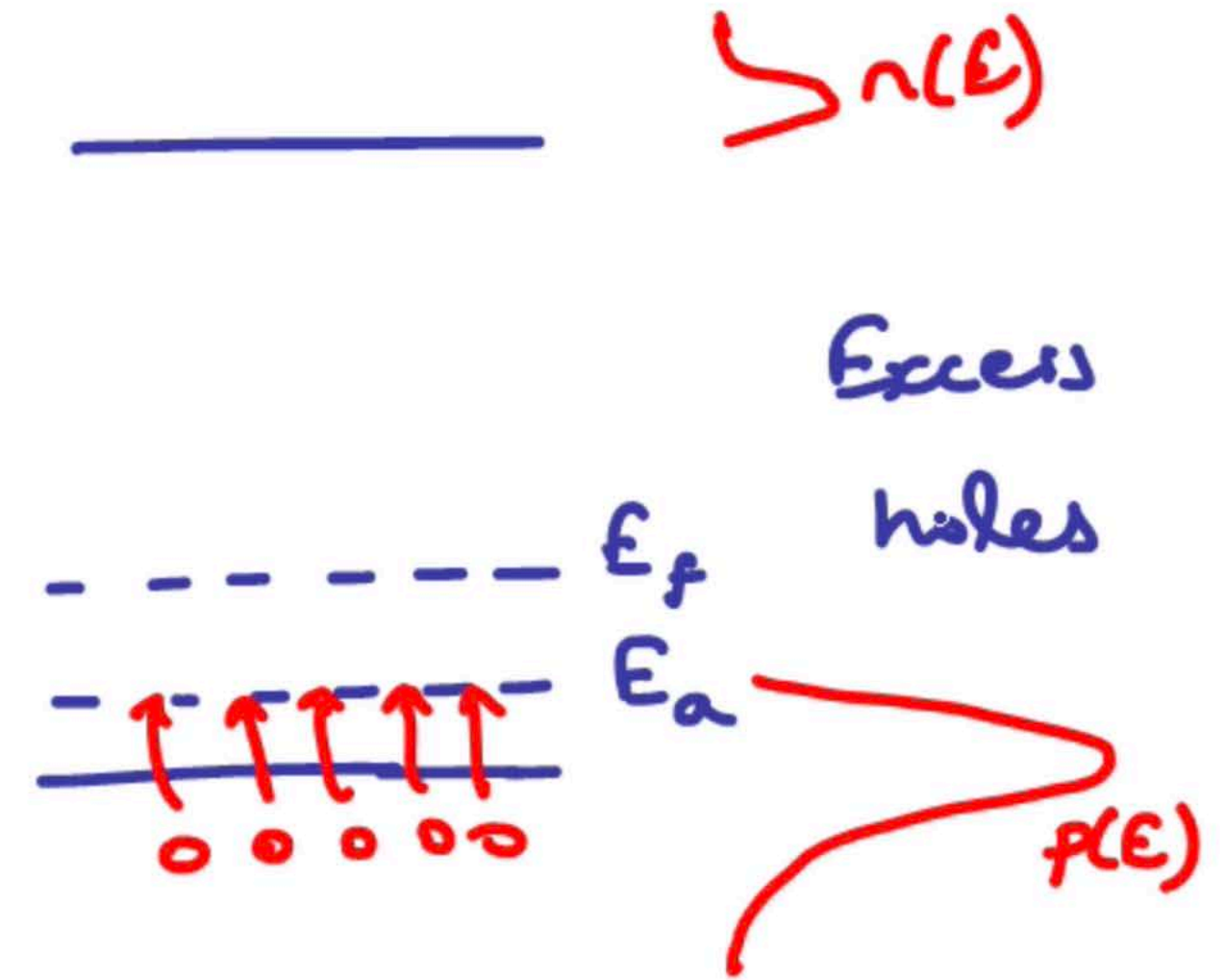


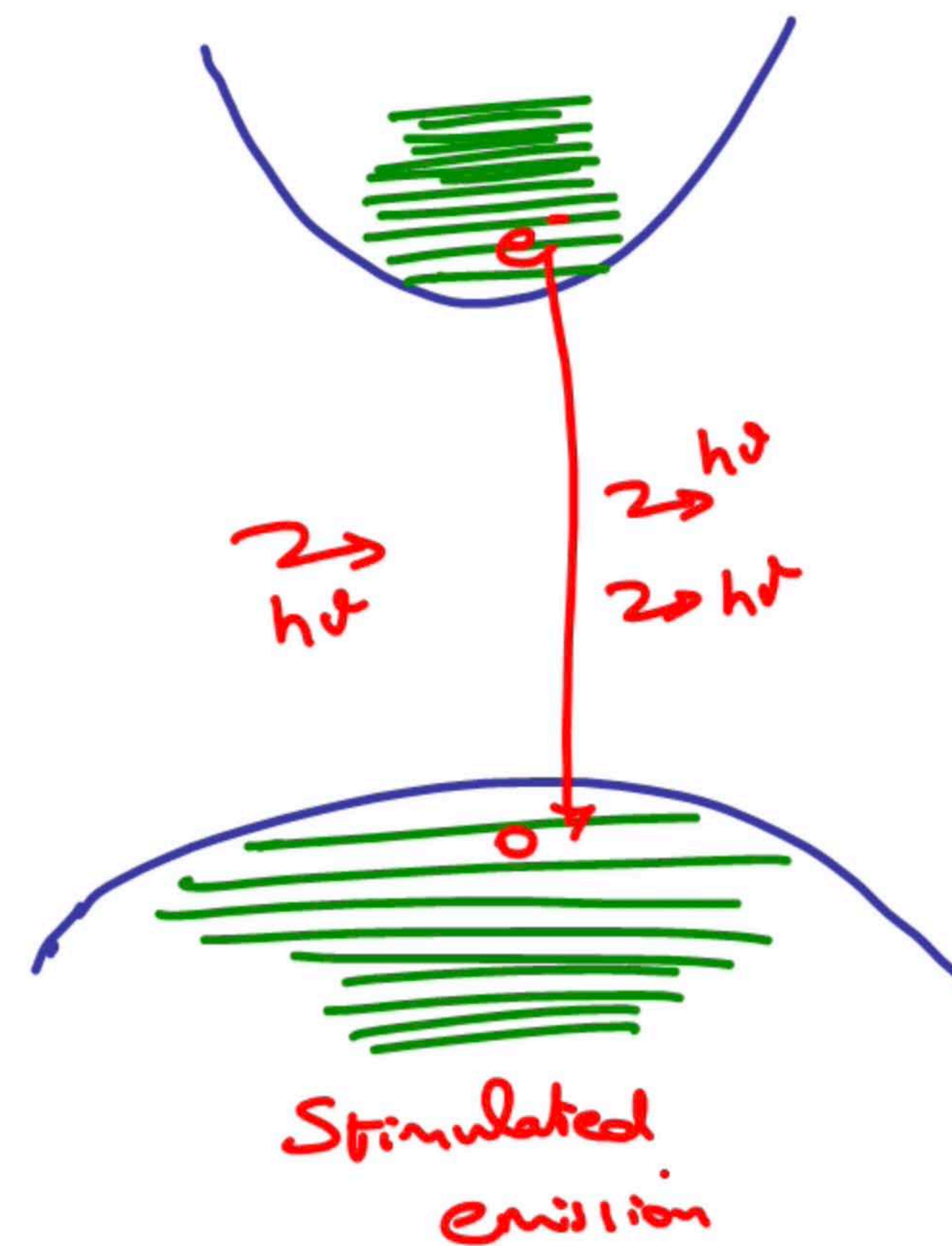
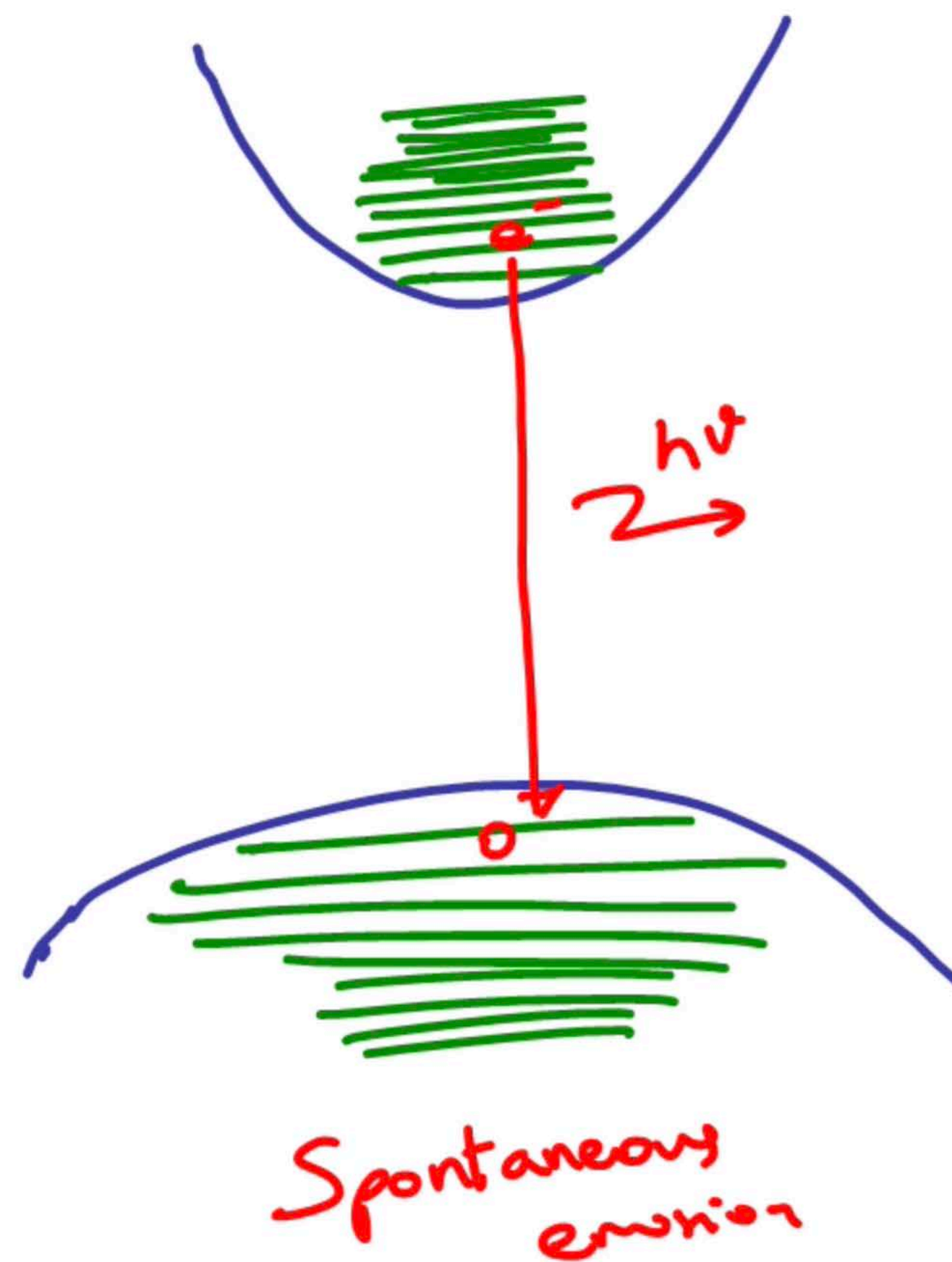
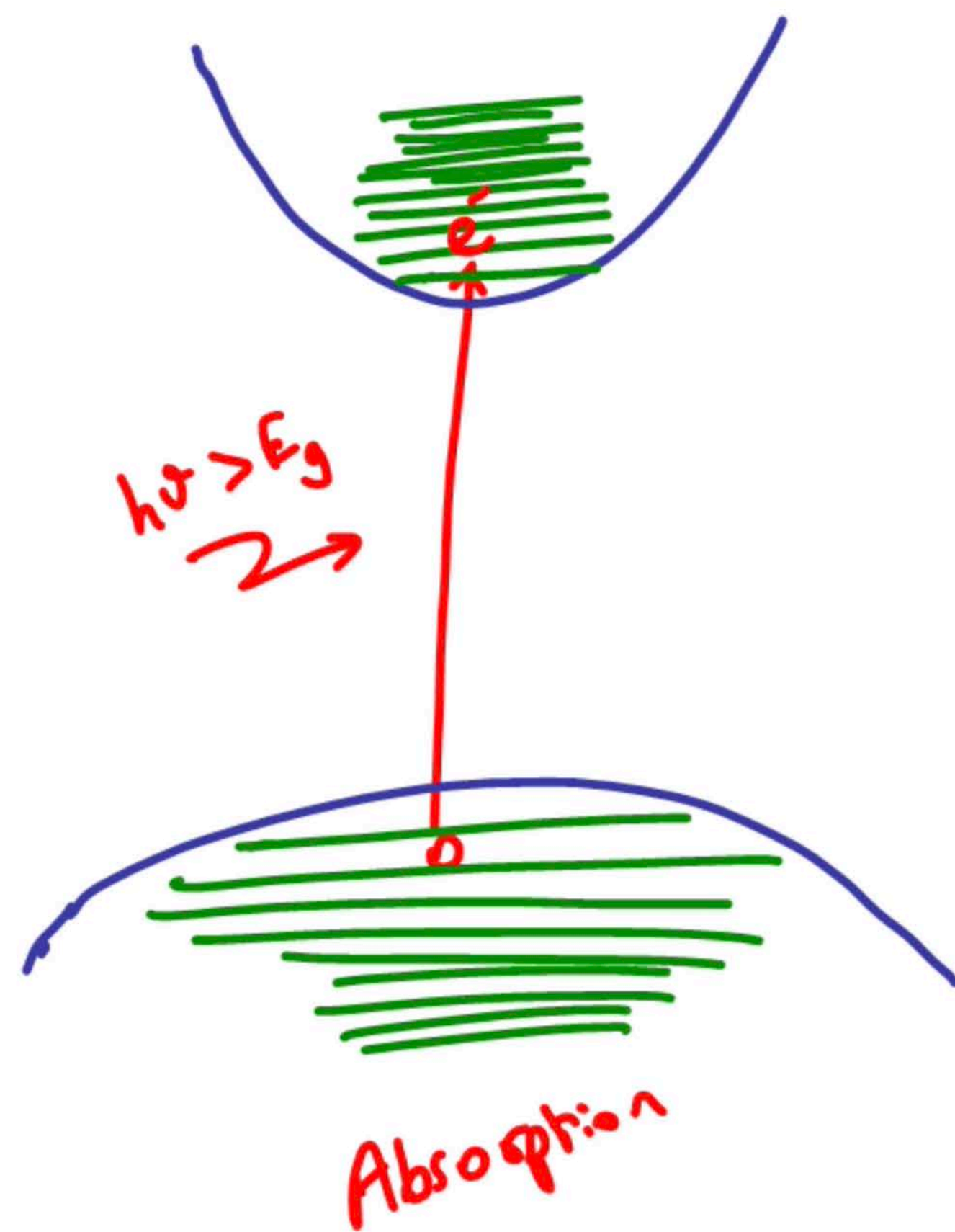
Extrinsic Semiconductors (doped)

n-type (Si doped w/ P has)



p-type (Si doped with Al)





lec_24_Fundamentals of Semiconductors.mp4

Note1 - Windows Journal

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B I

Note Title

Learning Objective: Identify fundamental principles of semiconductor light sources & detectors

Schrodinger wave equation

$E_g \gg k_B T$
25 meV

Conduction Band

Forbidden gap

Valence Band

Bandgap E_g

E_c

E_v

Kronig-Penney Model

Dilute Atomic

1

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1 of 7 selected, 2.09 TB available

10:59 AM 10/4/2018

Screenshot 2019-09...9.22 PM

Prof. Balaji Photonics

Screenshot 2019-09...9.35 PM

Prof. Deepak Khemani(2019)

Screenshot 2019-09...9.49 PM

Computational Electromagnetics

DEEP

GERMAN - 2

Intro to photonics

Screenshot 2019-09...0.07 PM

Screenshot 2019-09...0.24 PM

Screenshot 2019-09...0.36 PM

Screenshot 2019-09...0.47 PM

Screenshot 2019-09...8.56 PM

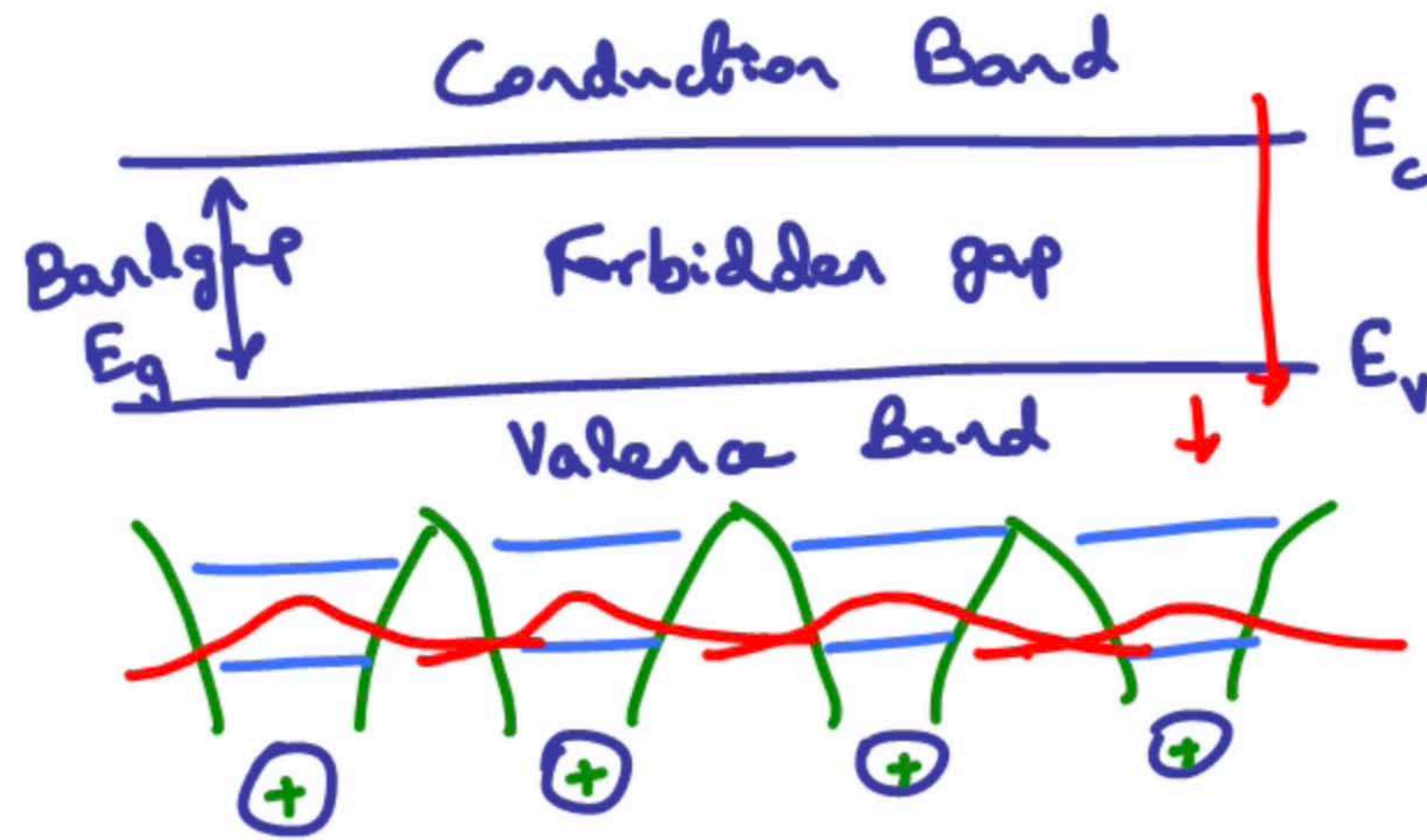
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Learning Objective: Identify fundamental principles of semiconductor light sources & detectors

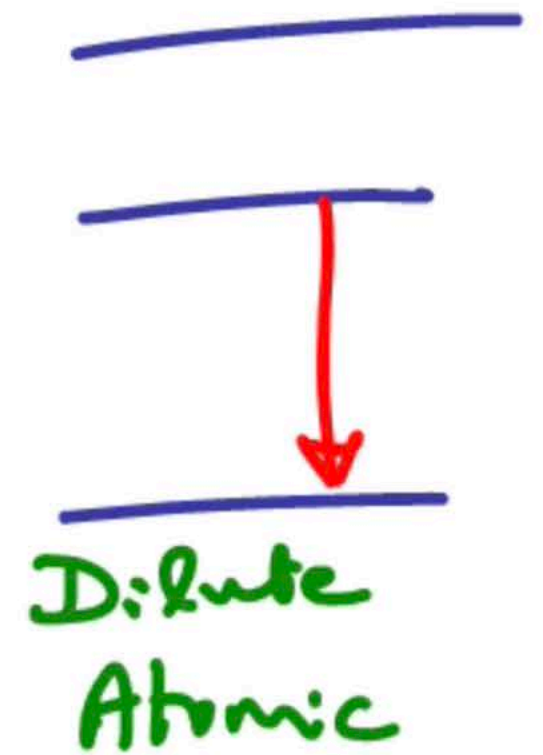
Schrodinger
wave equation

$$E_g \gg k_B T$$

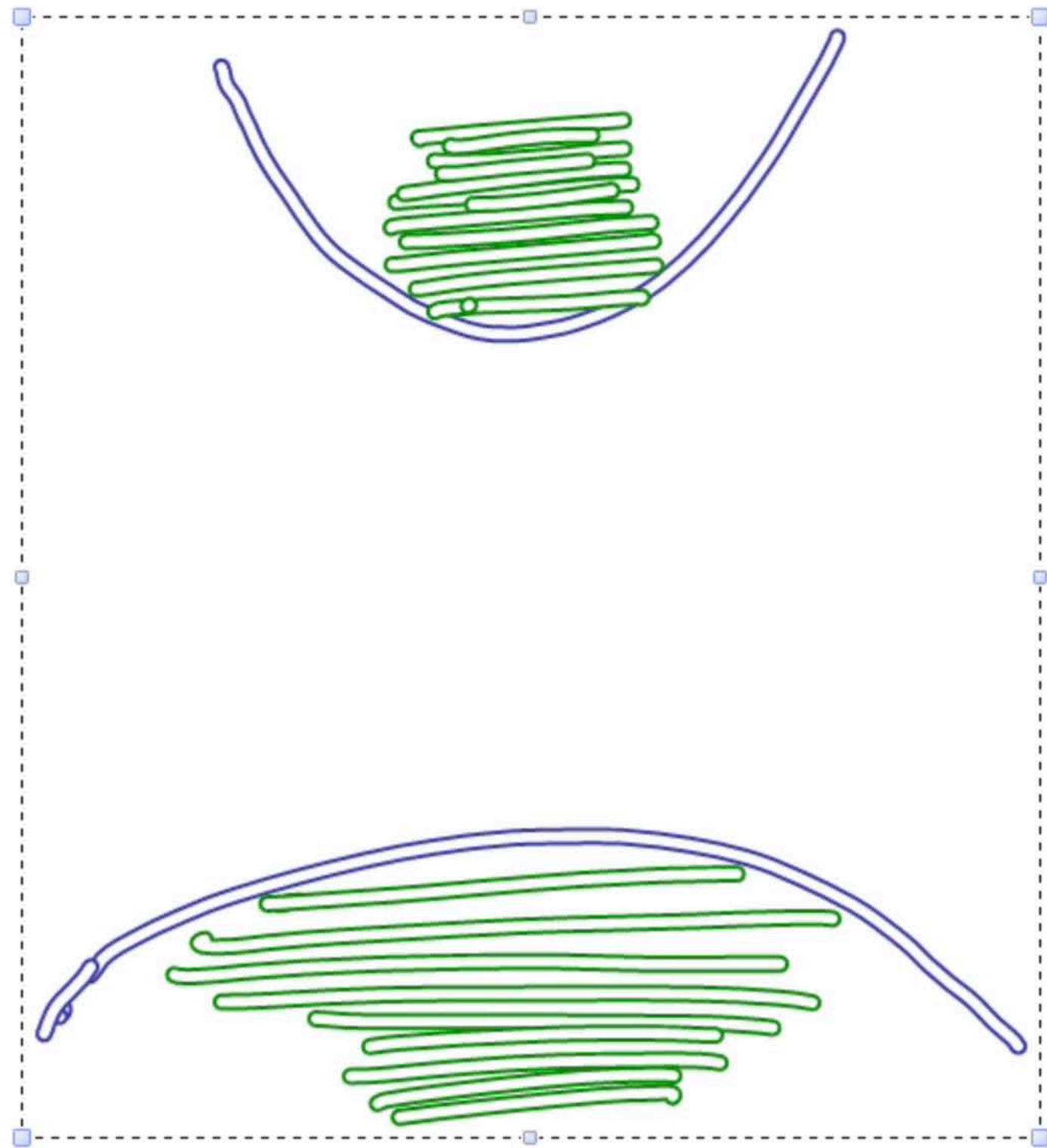
25 meV



Kronig-Penney Model



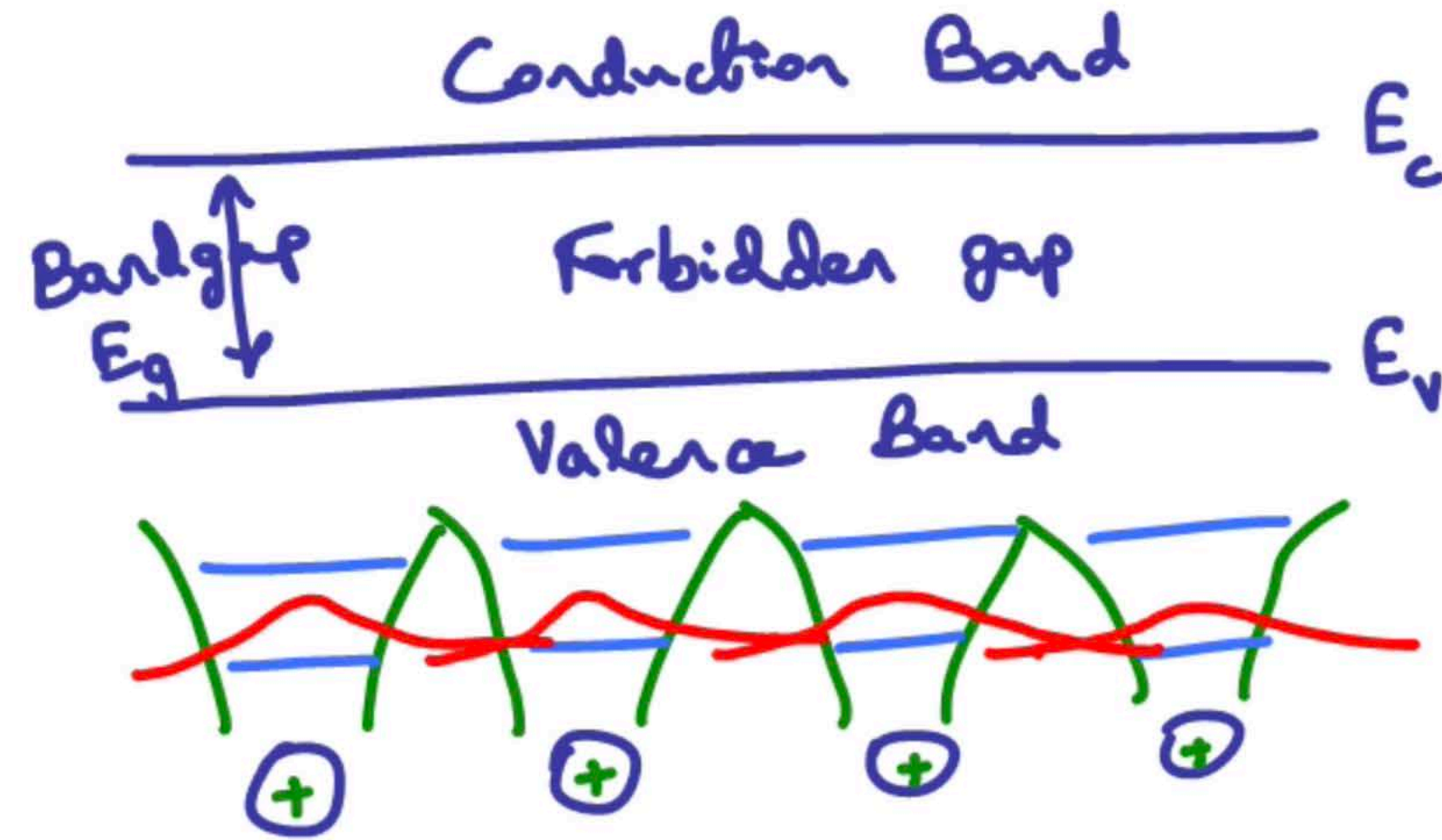
Learning Objective: Identify fundamental principles of semiconductor light sources & detectors



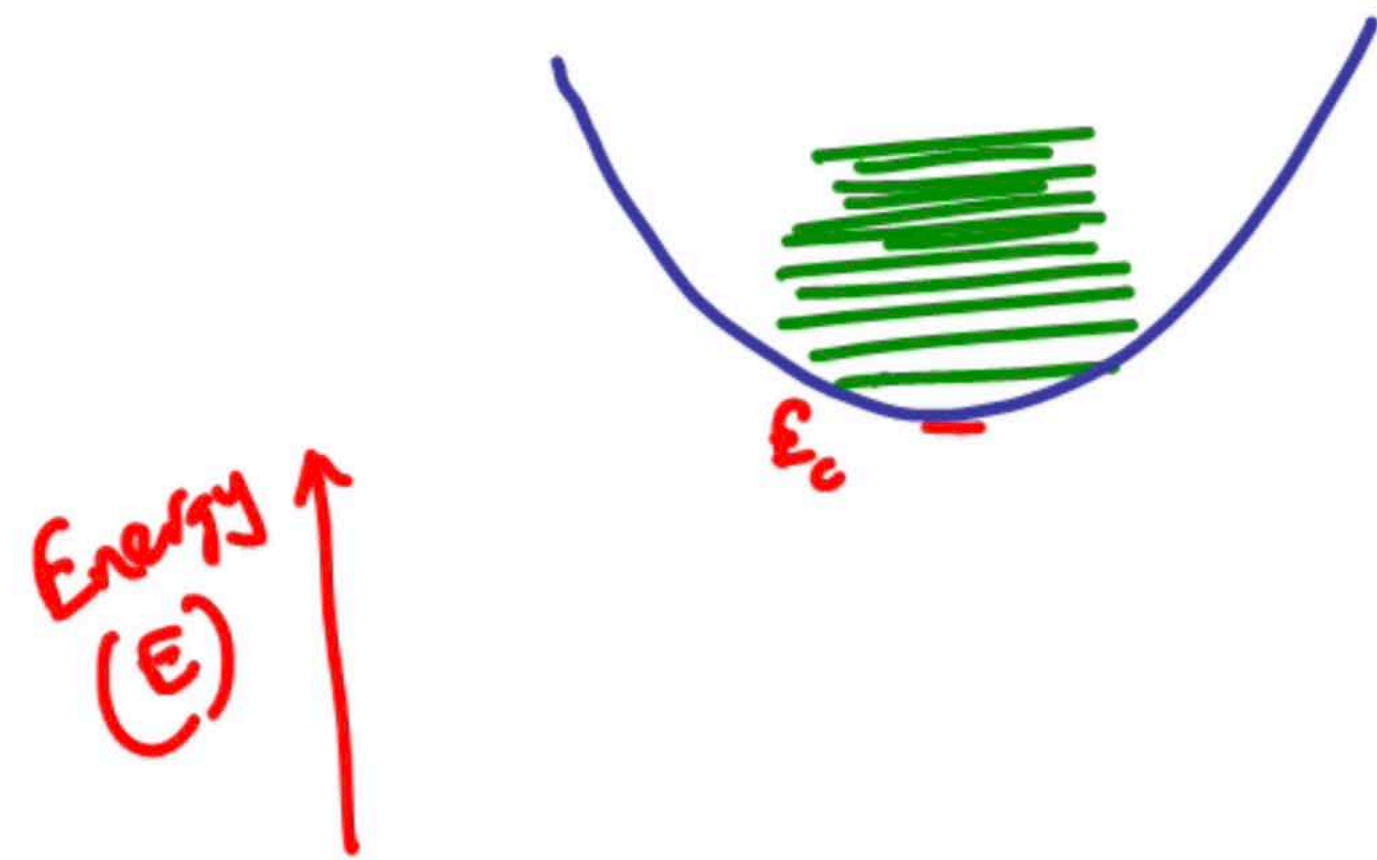
Learning Objective: Identify fundamental principles of semiconductor light sources & detectors

Schrodinger
wave equation

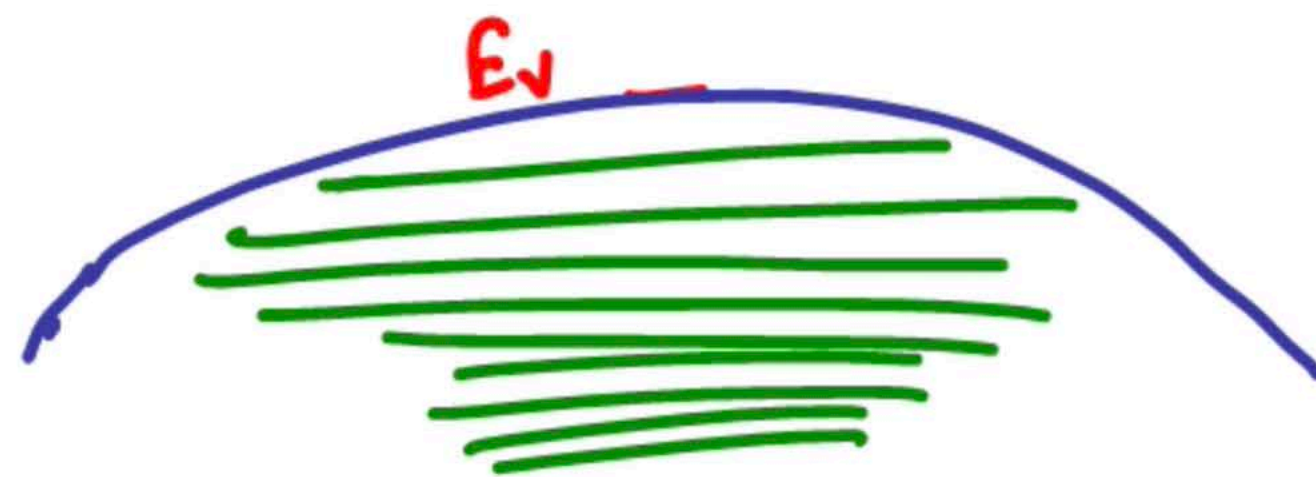
$$E_g \gg k_B T$$



Kronig-Penney Model



$$E = E_c + \frac{\hbar^2 k^2}{2m_c}$$



$$E = E_v - \frac{\hbar^2 k^2}{2m_v}$$

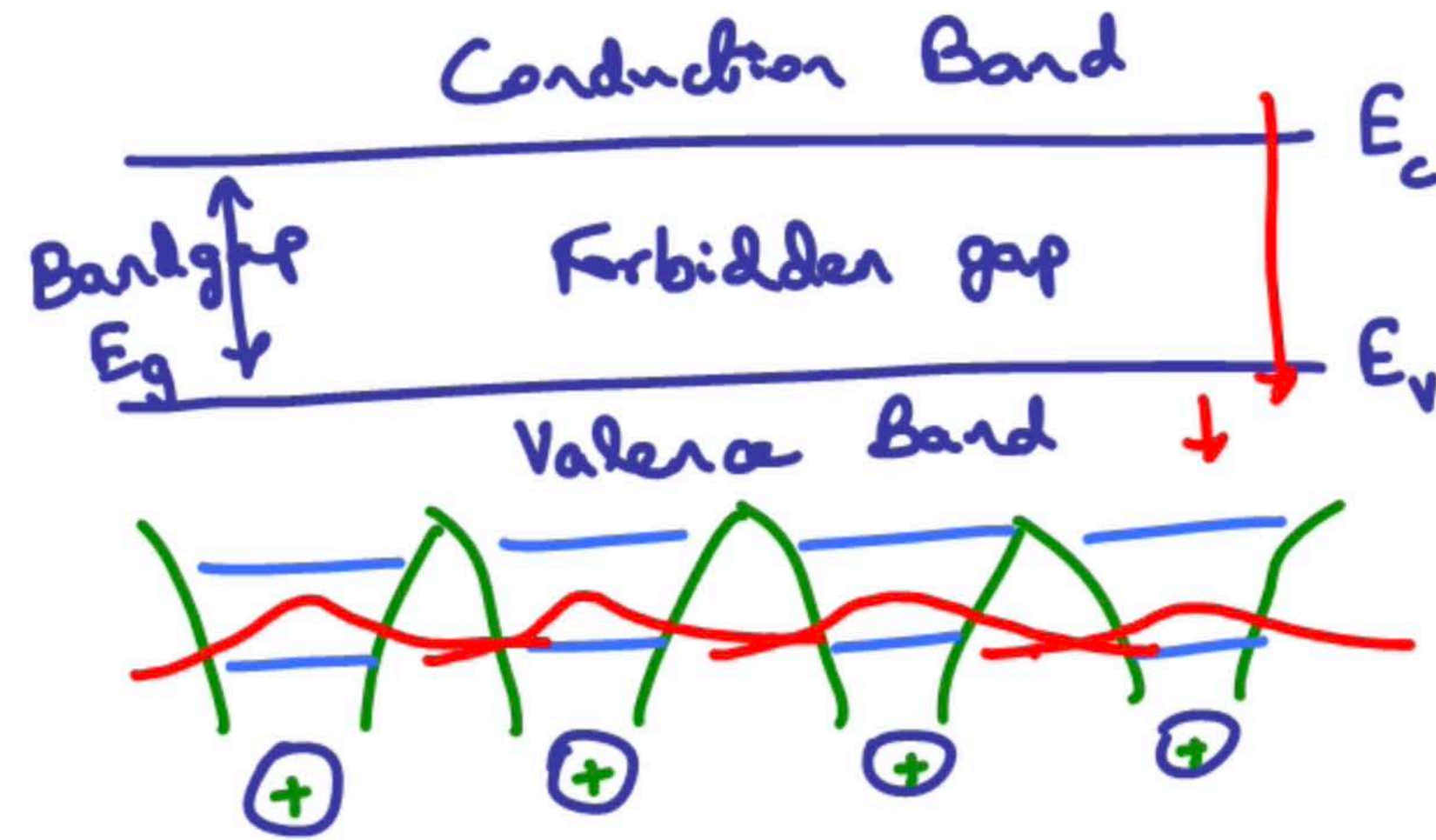
→ Momentum (k)

Learning Objective: Identify fundamental principles of semiconductor light sources & detectors

Schrodinger
wave equation

$$E_g \gg k_B T$$

25 meV



Kronig-Penney Model

