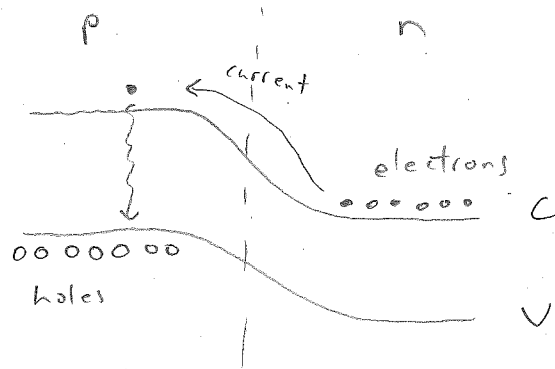


Lecture 15 Photodiodes & LEDs

"Opto-electronic" devices

LED: basically just a diode = pn junction

Recall:



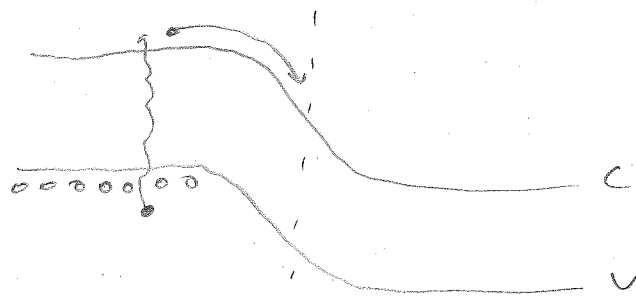
Forward voltage drives recombination current

- voltage reduces "hill"
- Thermal electrons climb hill
- Recombine with holes = decay from C to V

Often decay by emitting a photon = emitted light.

Really, all diodes emit light, LEDs are optimized & packaged to work well.

Photodiode: same thing in reverse



Electrons in valence band can absorb photon, excite to conduction band

If near junction, e^- is attracted to n-type, rolls down hill
⇒ get current \propto light intensity

Usually make photodiodes thin, with large junction area, since need absorption near junction