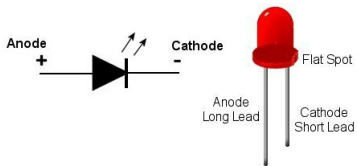


# LED Light Emitting Diode

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20. marca 2016

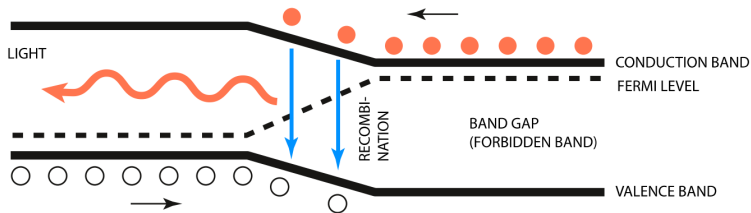


# História

1. 1907 - prvé elektricky generované svetlo pomocou emisie na SiC
2. 1955/56 - dokázanie elektroluminescencie kvôli rekombinácii
3. 1962 - pozorovanie svetelnej emisie z P-N prechodu
4. 1960 - viditeľné svetlo (Ga, As, P) (červené, zelené)
5. 2014 - Nobelova cena - modrá LED dióda - GaN

# Princíp

1. P-N prechod
2. Rekombinácia elektrónov a dier následné vyžiarovanie fotónu



**Fig. 1.** Principle for light emission in a p-n junction. In a p-n junction biased with a forward voltage, electrons are injected from the n- to the p-side, and holes are injected in the opposite direction. Electrons recombine with holes and light is emitted (spontaneous emission). For efficient diodes it is important that the semi-conductors have direct bandgaps. LEDs with indirect bandgaps require phonon-assisted recombination, which limits the efficiency. The quantum efficiency of a LED is the ratio of the number of emitted photons to the number of electrons passing through the contact in a given time.

Ďakujem za pozornosť

