

Explain the role of a sensor in imaging. Explain the principle of photon counting. Which size of sensors is of preference in practice? Explain the trade-offs.

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Sensor: role

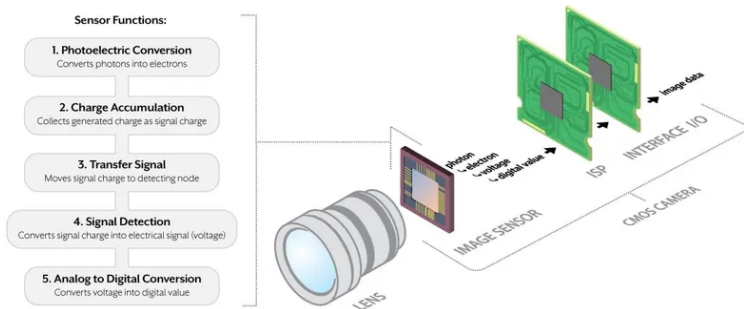
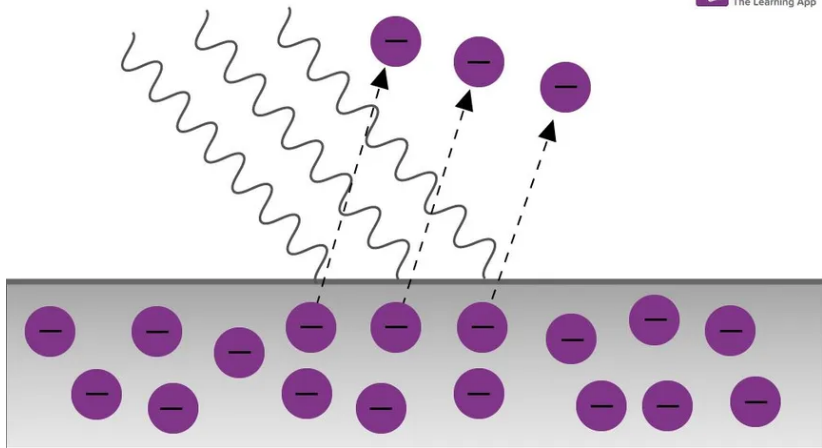
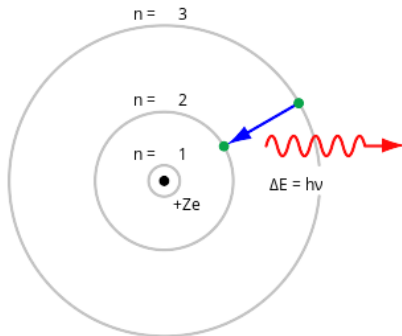


Figure 1: source: thinklucid.com

Photon counting



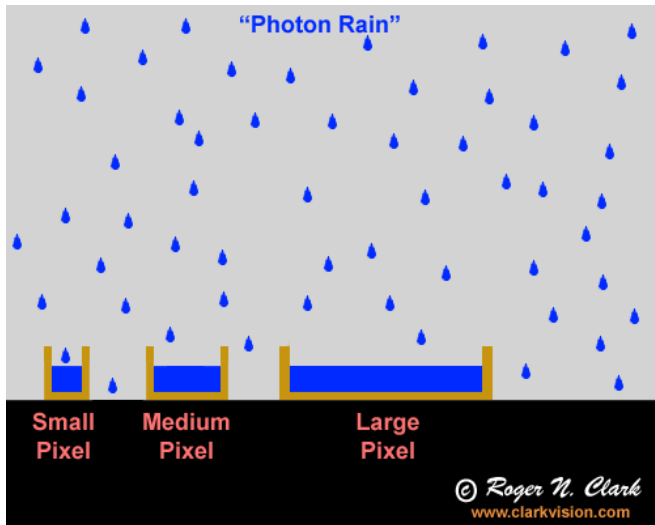
What I understand



(source: wikipedia)

$$E_{\text{photon}} = hf = h \frac{c}{\lambda} \quad (h \text{ is the Planck constant})$$

Analogy



Preferences

Small pixel

- ▶ Better resolution
- ▶ More noise

⇒ lot of small pixels !