Geiger Counter

Anode
+
−

Ionized gas atom   Ionizing radiation

[from Wikipedia]

Spread of avalanches in a Geiger-Muller tube

Tube wall (- ve)

Path of radiation particle   Original ionisation event

anode wire (+ve)

Key
- Ionisation event
- Ionising electron path
- Liberated electron path
- p UV photon path & collision
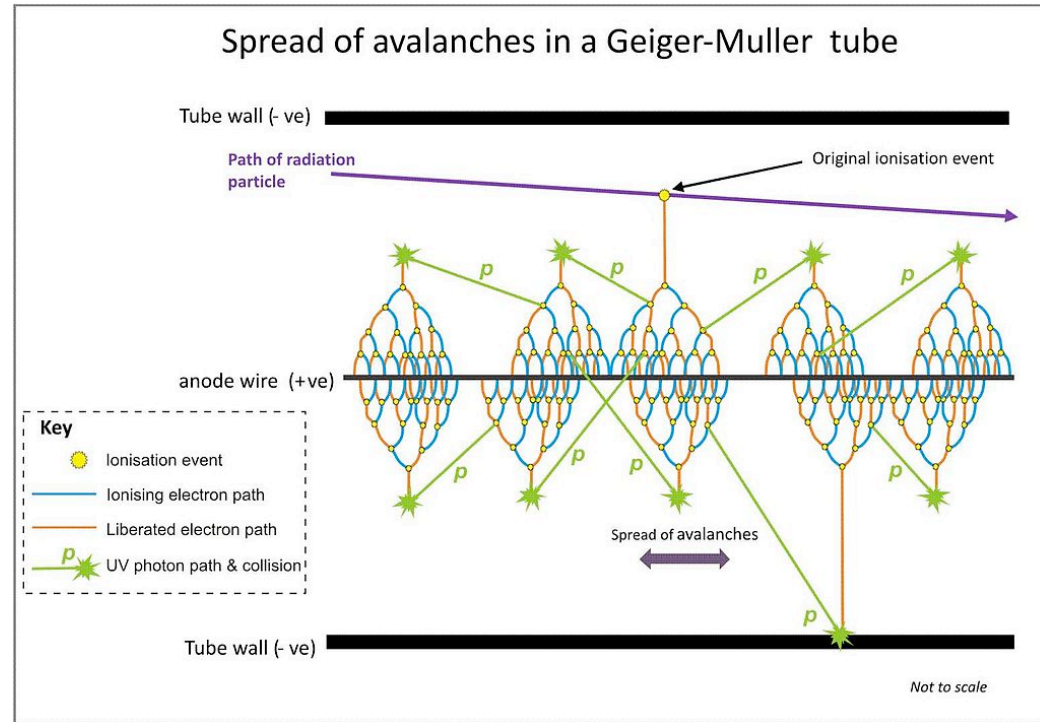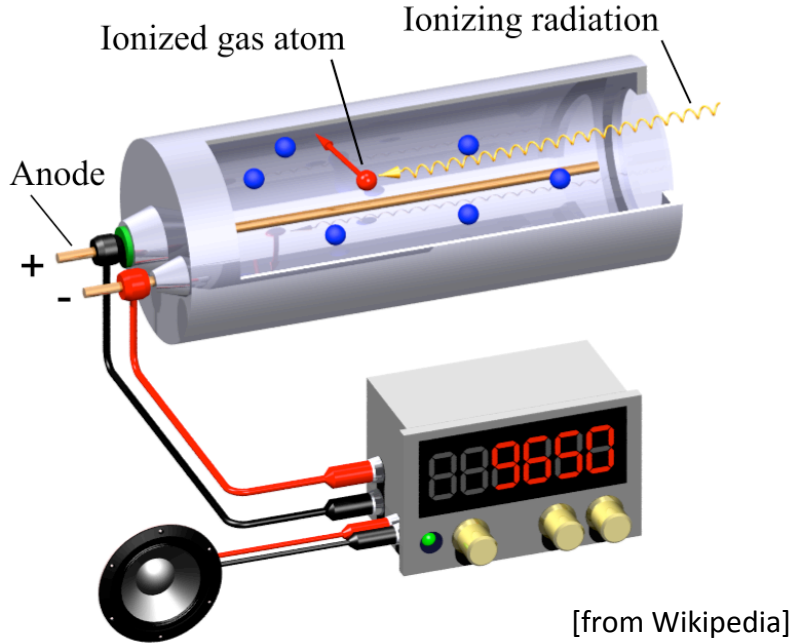
Spread of avalanches

Tube wall (- ve)

Not to scale

- Detects ionizing radiation: gamma, beta (e^+ or e^-), alpha (has to get into detector!)
- Geiger-Müeller tube with low-pressure inert gas (e.g., helium, neon, argon)
- High voltage between central anode (+) and inner-wall cathode (-)
- Electron knocked out by radiation is accelerated toward anode, creating an avalanche of additional electrons that is detected as a pulse of current
- Count pulses and/or output to a speaker (clicks)
- Limitations: doesn't measure energy; doesn't differentiate radiation types; deadtime (finite duration of pulse precludes new pulse) limits the maximum count rate