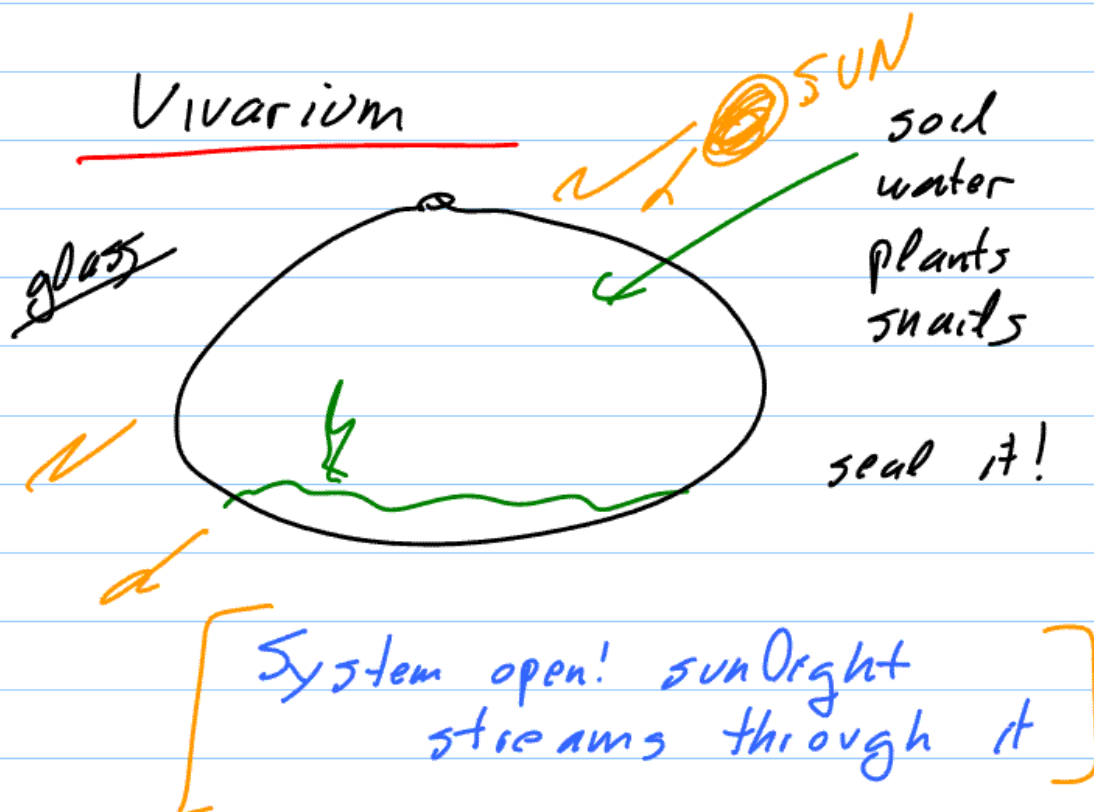


PHY100S - The Magic of Physics - Class 17

"But what is light really? Is it a wave or a shower of photons? There seems no likelihood for forming a consistent description of the phenomena of light by a choice of only one of the two languages. It seems as though we must use sometimes the one theory and sometimes the other, while at times we may use either." -- Einstein and Infeld, **The Evolution of Physics**



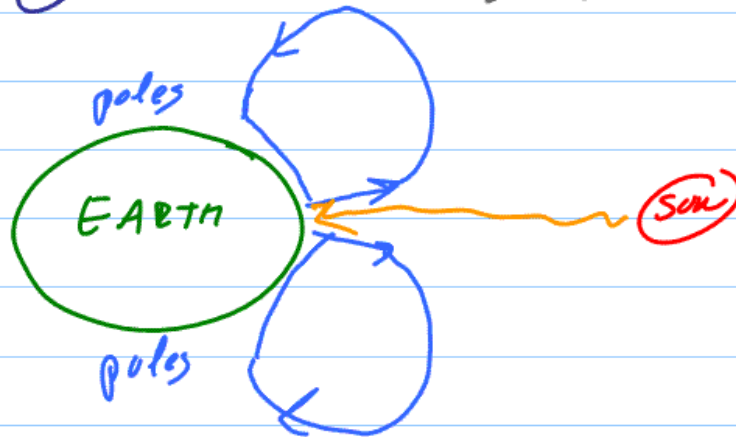


disorder \Rightarrow ordered

1 trillion kg biomass

Energy sources

- ① Solar panels
- ② Wind solar!



- ③ Hydro solar!
- ④ Biomass solar!

⊙ Petroleum, coal,
natural gas.

stored solar power
use as if the
Earth closed

⊙ Nuclear wrong in
principle!

§ 13.2 - Photoelectric Effect

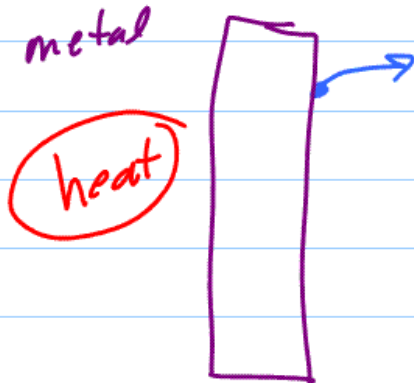
Background!

⊙ Metals "conductors"
electric currents i.e.
charges in motion
electrons

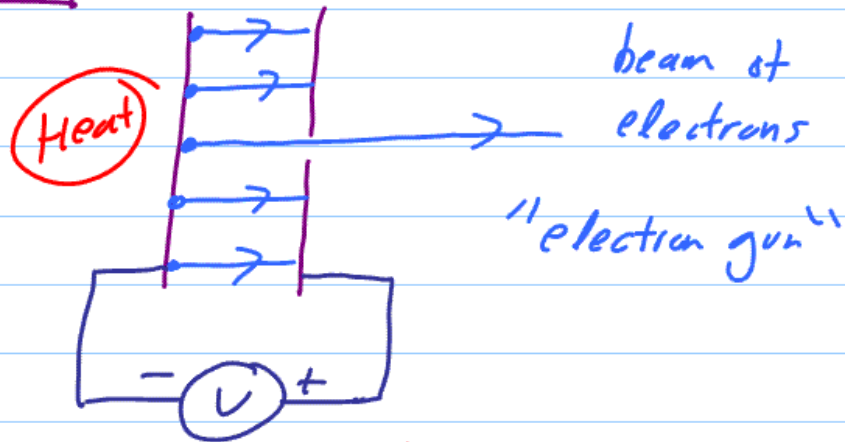
electrons not bound
strongly to metal

① Thermionic emission (1873)

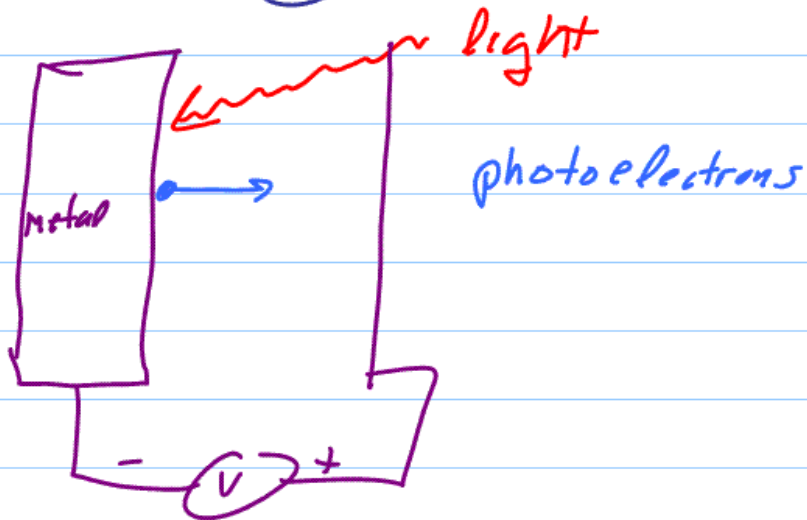
electrons boil off surface



fraction of mm away - pulled back in



"electron gun"



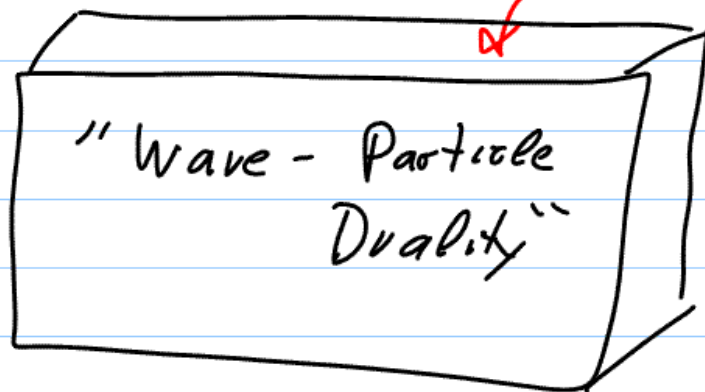
Explain } Planck (1900)
 } Einstein (1905)

Light is a particle. "photon"
Forget about it as a wave

Photon strikes an electron
gives up its energy to
the electron.

Energy of photon \propto

frequency of light



ignorance