

PHY100S - The Magic of Physics - Class 8

"Things should be made as simple as possible, but not any simpler." -- Einstein

§8.5 - Magnetic Force



"magnetic poles"

wire carrying a current!
microscopically it
is charges in
motion

moving charges exert magnetic force
on magnets

magnets have net currents

moving charges exert magnetic
forces on other moving charges

§ 8.6 - 8.7 Atomic Structure.

Modern atom - Dalton (1808)

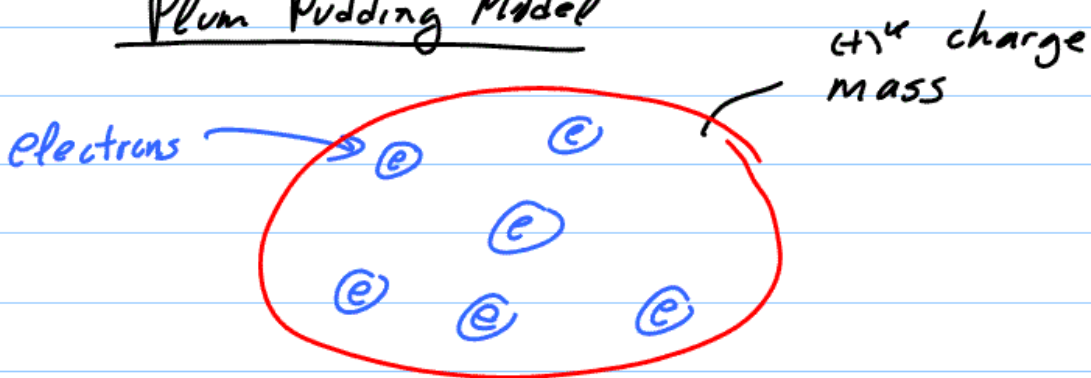
Thomson (1897) - discovered electron

mass \ll mass of atom

$(-)^{ve}$ charge

atoms have 0 net charge

Plum Pudding Model



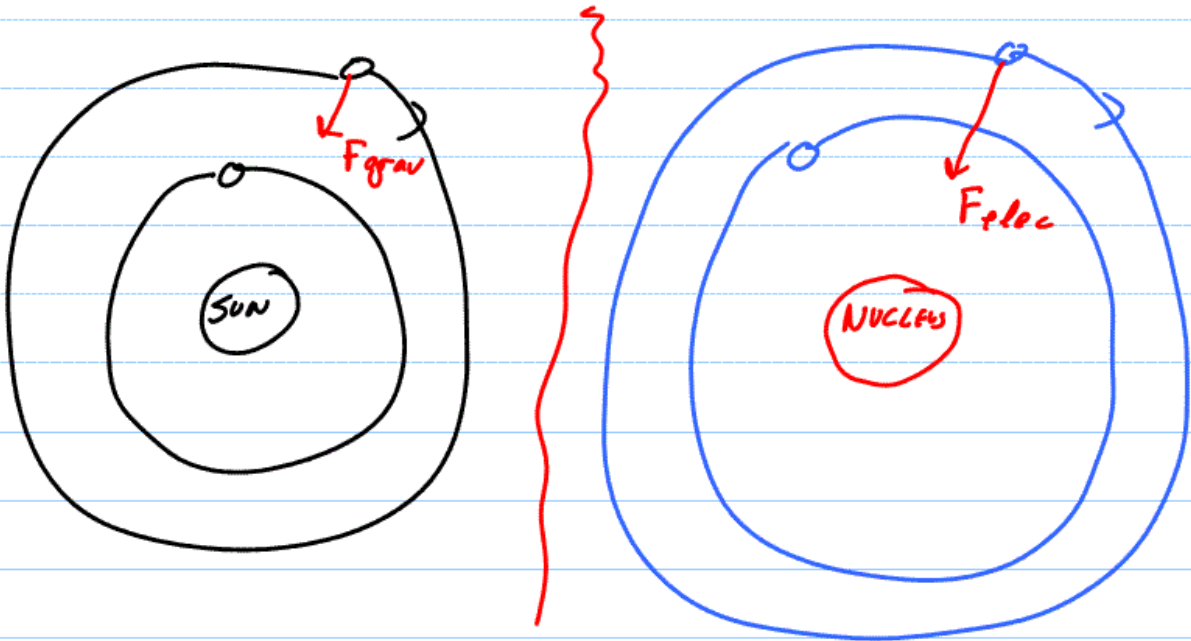
Rutherford (1911) discovered nucleus

mass \sim mass of atom

$(+)^{ve}$ charge

very very small

Planetary Model of Atom:

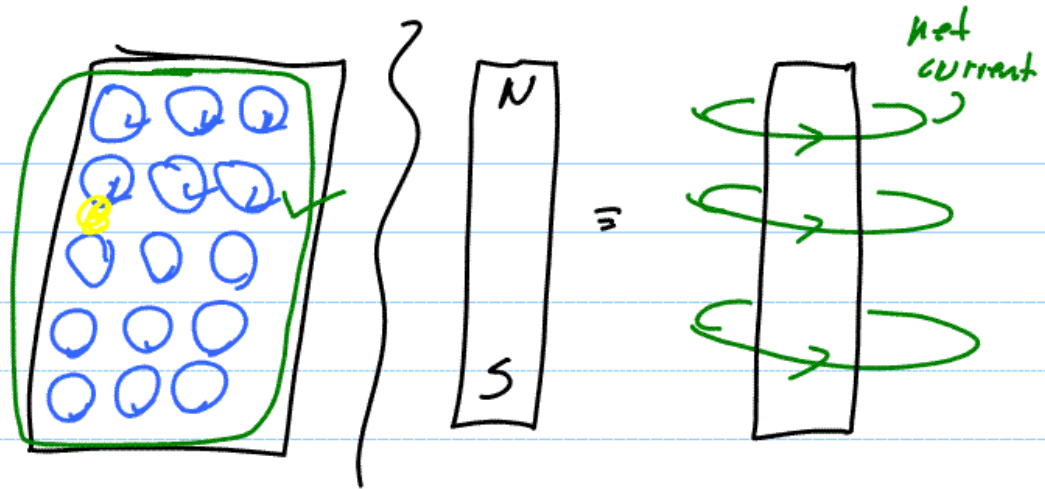


rub fur's rubber!

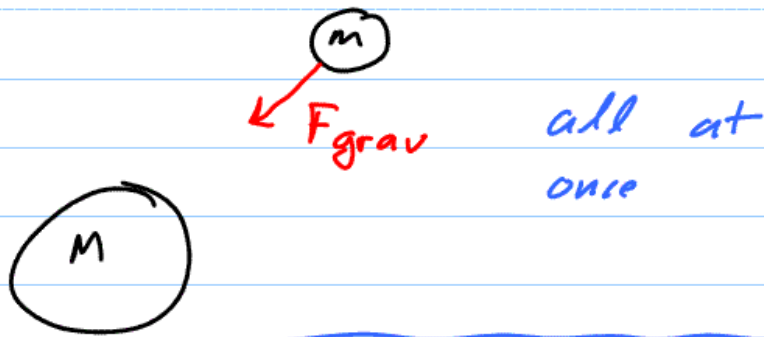
electrons fur \Rightarrow rubber

positive
charge

negative
charge



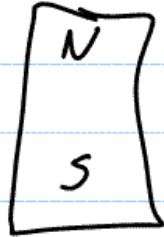
CHAPTER 9 - FIELDS



- ① M causes a gravitational field around it
- ② Mass m has a F_{grav} on it due to the field

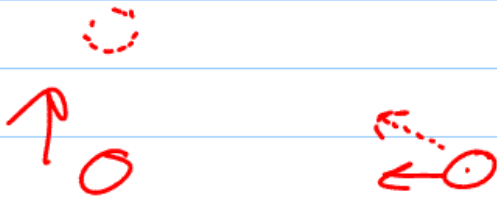


- electric field



- magnetic field

§9.2 LIGHT - Wave of What?

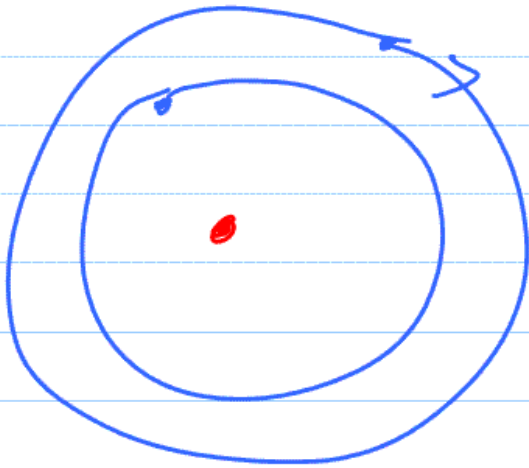


Oscillating Charge



"kink" in $\left. \begin{matrix} \text{magnetic} \\ \text{elec} \end{matrix} \right\}$ field
moving away at
speed of light

any accelerating charge radiates energy as a em wave.



planetary model is wrong

radio broadcast antenna



em wave

radio antenna



frequency of source = frequency of
generated wave

OUT OF ORDER

§ 9.4 - Spectra

temperature \Rightarrow generate em wave.
atoms are oscillating