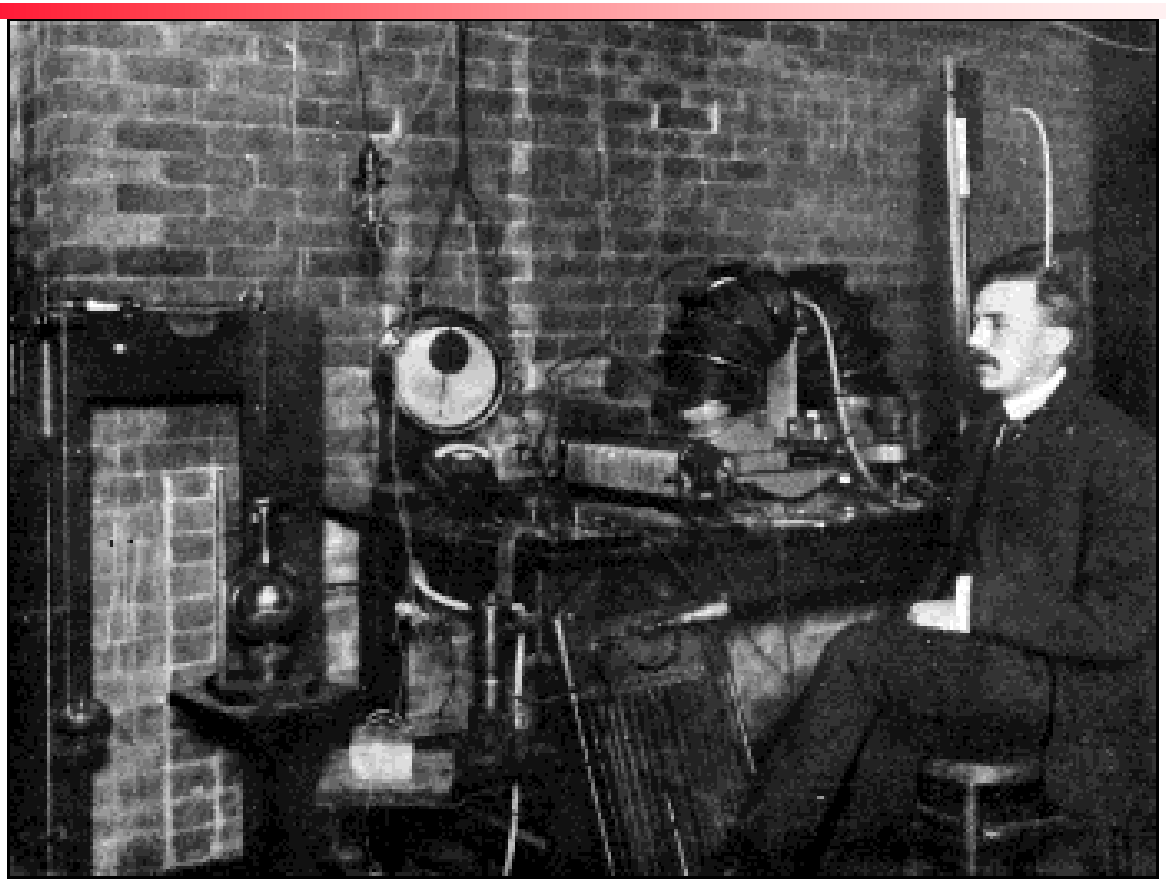
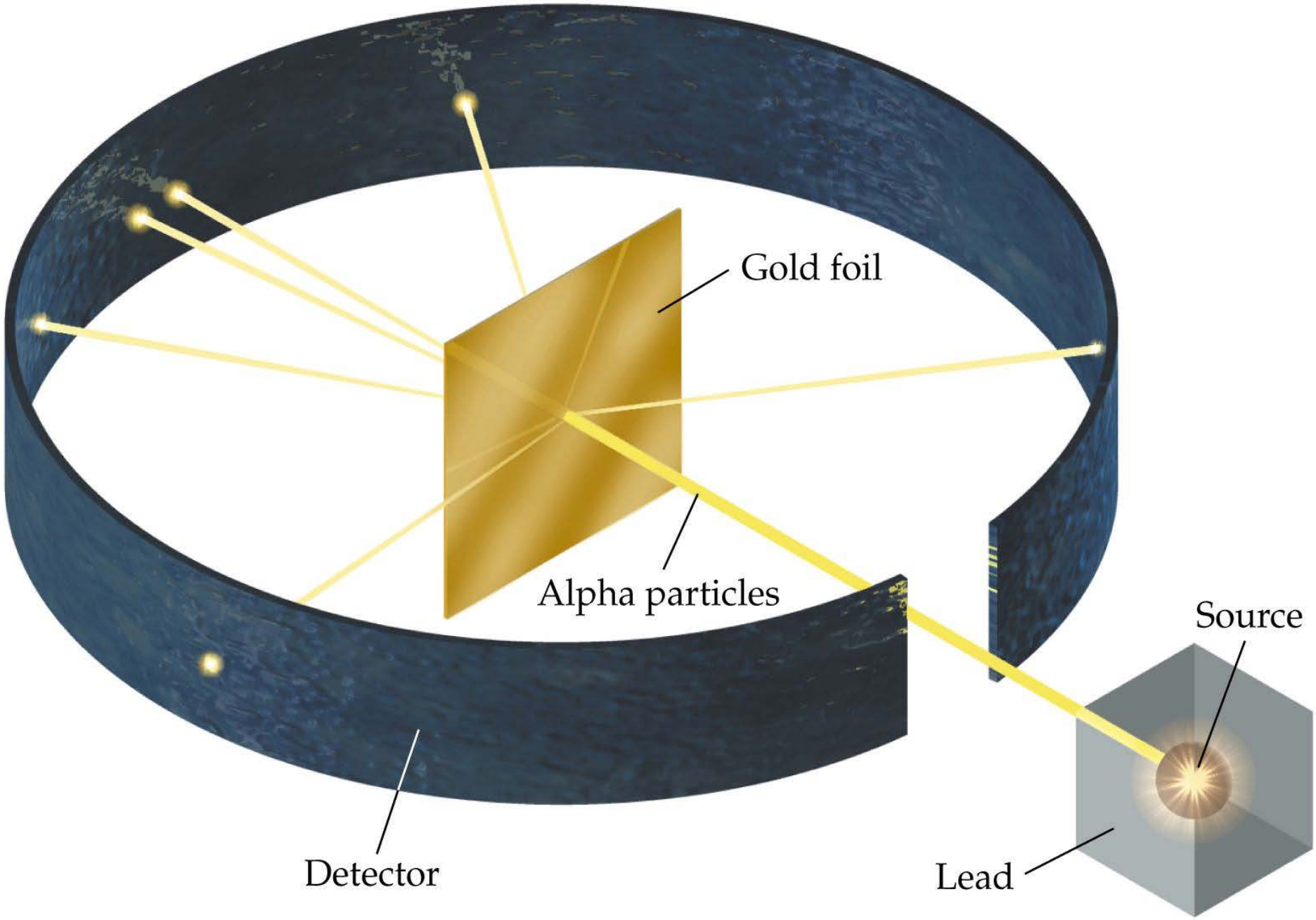
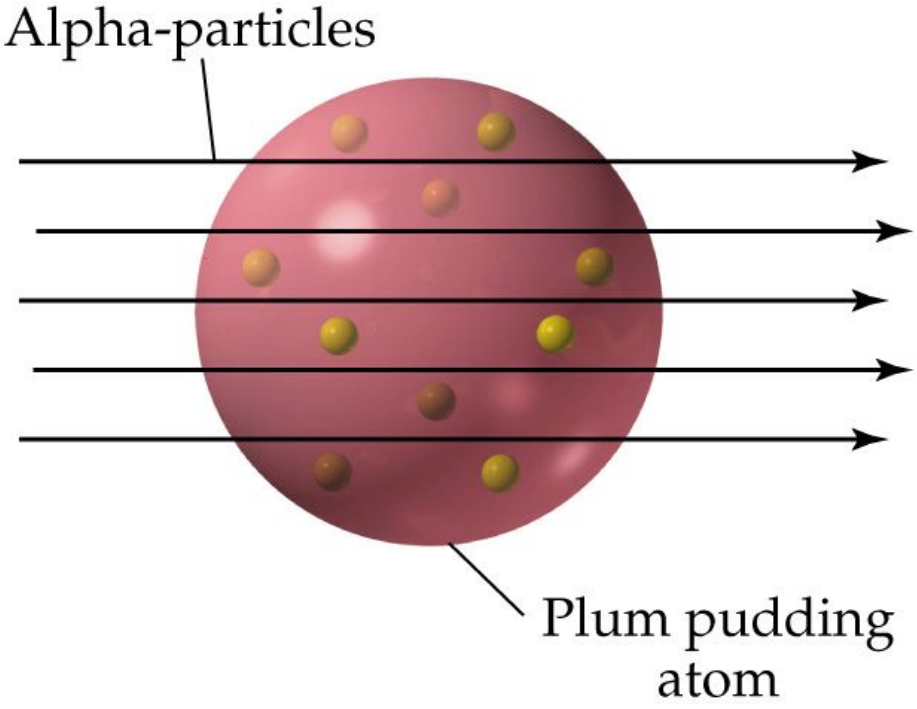
Rutherford's Gold-Foil Experiment



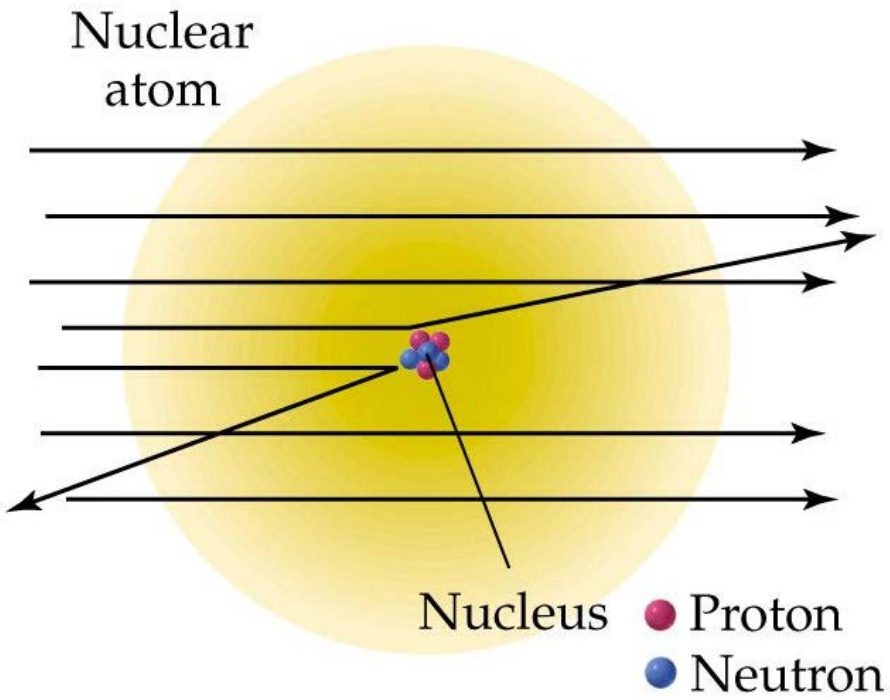
The Alpha Particles Experiment

- In his experiment Rutherford used a very thin sheet of gold as a target, and he shot a beam of alpha particles at the gold.
  - alpha particles (α-particles) are helium nuclei without electrons, and are a form of radioactivity
- Nearly all of the alpha particles passed through the thin sheet of gold.
- Rutherford also noticed that a few particles were deflected from their straight- line path, some by 90 degrees or more.


Gold foil
Alpha particles
Source
Detector
Lead

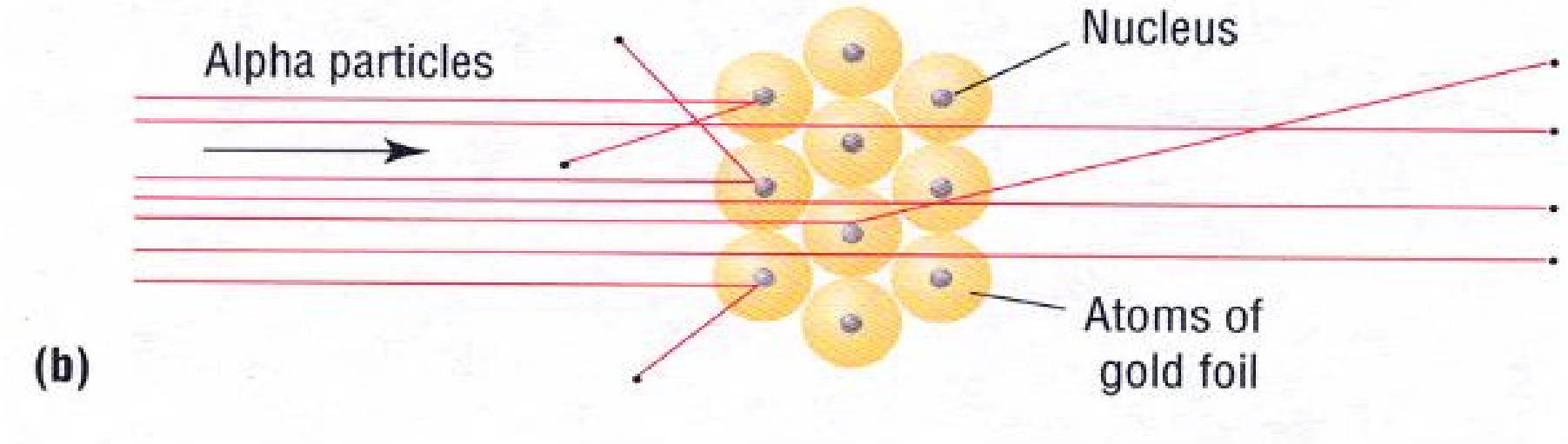


(a) Rutherford's Expected Result



(b) Rutherford's Actual Result

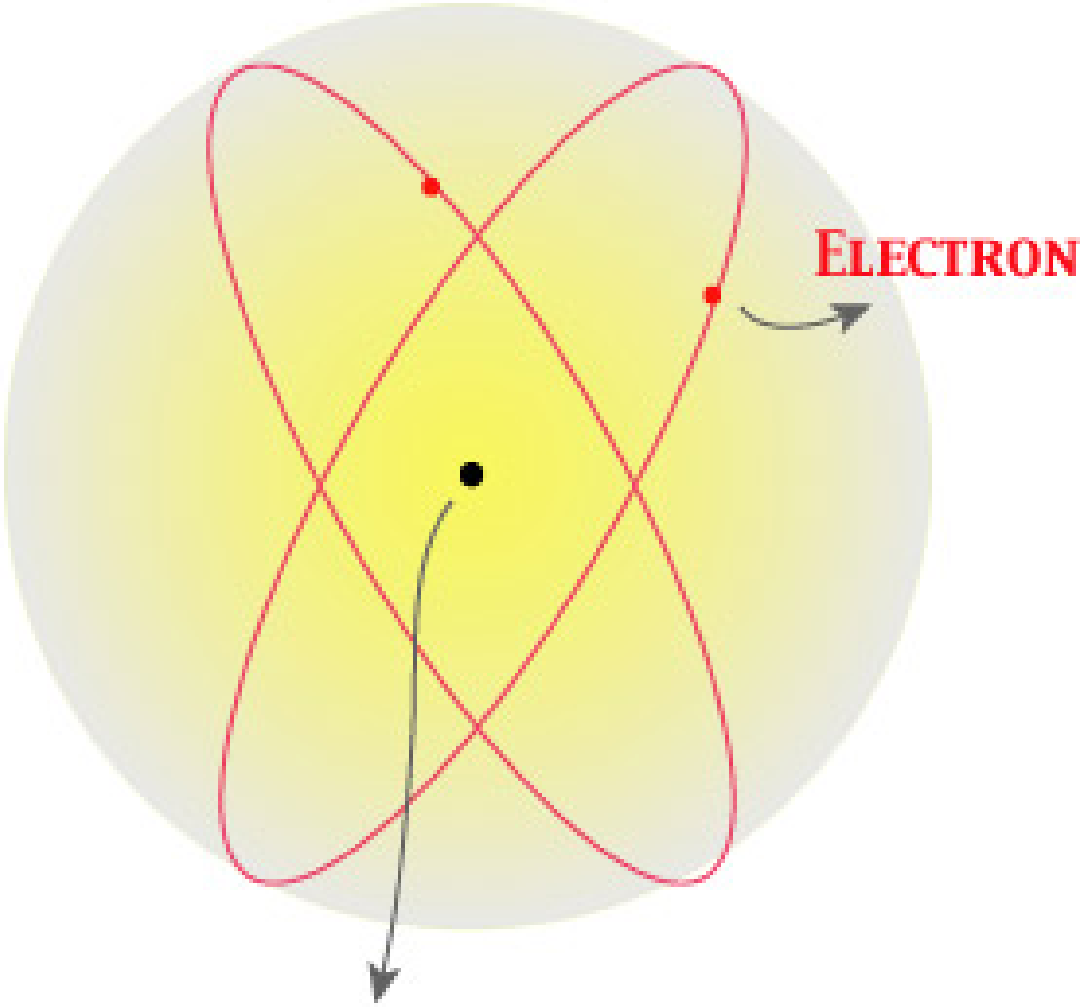
Rutherford's Experiment



Conclusion

- The beams were bouncing off the positively charged core of the atoms.
- Rutherford originally called this a proton, because it was positively charged.
- Later, it was renamed the nucleus. The nucleus of the atom has almost all the mass of the atom.
- Therefore, most of an atom is empty space.

Rutherford's Model of Atom



Nucleus, about the size of 1/5000 of the whole atom