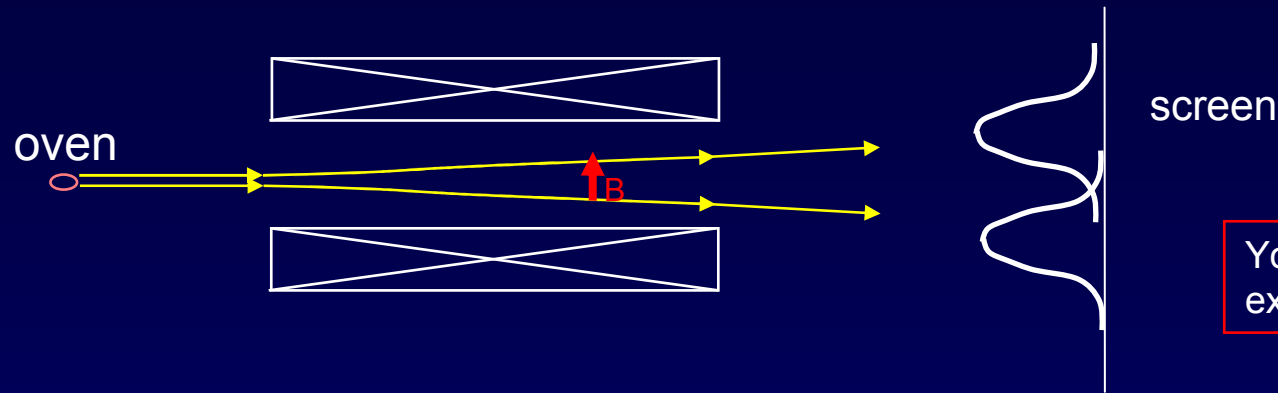


Back to the Stern-Gerlach Experiment



You will analyze this experiment in discussion.

The beam split in two! This marked the discovery of a new type of angular momentum, with an m_s quantum number that can take on only two values:

$$(s = 1/2) \quad m_s = \pm 1/2$$

The new kind of angular momentum is called the **electron "SPIN"**. Why?

If the electron were spinning on its axis, it would have angular momentum and a magnetic moment (because it's charged) regardless of its spatial motion.

However, this "spinning" ball picture is not realistic, because it would require the point-like electron to spin so fast that parts would travel faster than c !

So we can't picture the spin in any simple way ... the electron's spin is simply another degree-of-freedom available to electron.

Note: Most particles have spin (protons, neutrons, quarks, photons...)