

## Chapter 8

Because of its orbital motion around the nucleus, the electron has an orbital magnetic moment  $\vec{\mu}$  given by

$$\vec{\mu}_0 = -\frac{e}{2m_e} \vec{L}$$



Because  $\vec{L}$  is quantized so is  $\vec{\mu}_0$

$$\mu_z = -\frac{e\hbar}{2m_e} m_l = -\mu_B m_l$$

↑  
Bohr magneton

also  $|\vec{\mu}_0| = \mu_B \sqrt{l(l+1)}$

If an external magnetic field is applied to the atom  $\vec{\mu}_0$  will precess around the field direction.

The angular precession frequency is

$$\omega_L = \frac{eB}{2m_e} \leftarrow \text{Larmor frequency}$$

$\frac{e}{2m_e}$  is called the gyromagnetic ratio.