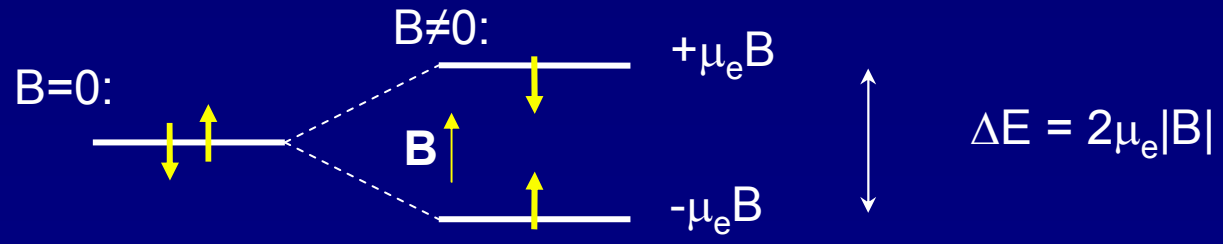
Electron Magnetic Moment

Because the electron has a charge and angular momentum, it has a magnetic moment, with magnitude: $\mu_e = 9.2848\times10^{-24}$ J/T.

One consequence of the 'quantization of angular momentum' is that we only ever measure the spin (and hence the magnetic moment) to be pointing 'up' or 'down' (where the axis is defined by any applied magnetic field). [Note: Because the charge of the electron is negative, the spin and magnetic moment point in *opposite* directions!]

In a uniform magnetic field (**B** = B_z**z**), a magnetic moment has an energy (Phys. 212): $E = -\mu\cdot\mathbf{B} = -\mu_z B_z$

Thus, for an electron, the two spin states have two energies:



Note: These arrows represent magnetic moment, not spin...