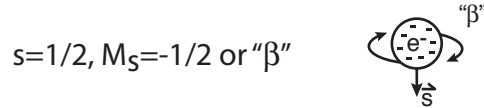
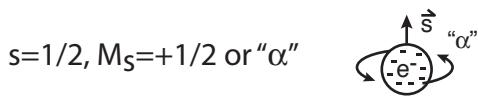


The classical view of electron spin:

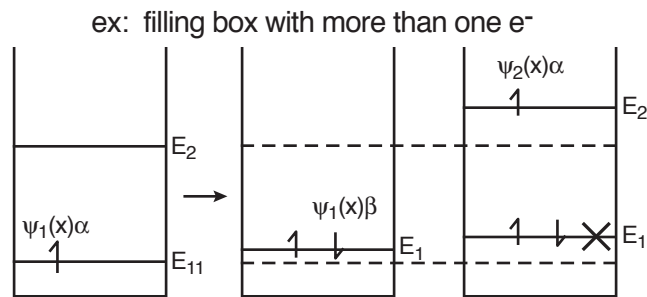


Rotating charge --> magnetic field

The existence of electron spin $\pm 1/2$ can be proved from a relativistic version of the Schrödinger equation, the Dirac equation. In non-relativistic quantum mechanics it becomes postulate (6):

	Only valid at low speeds:	Valid near speed of light
Only valid for large things:	Newton's equations	Special relativity
Also valid for small things:	Schrödinger equation	Dirac equation

Filling energy levels with electrons:



Electrons are Fermions, so by the Pauli exclusion principle (proved from postulate (6)), only one electron can be in a quantum state. Thus once the two spin up/down possibilities are filled up, the next electron has to go into a different degenerate energy state, or into a higher energy state.