

Nuclear Magnetic Resonance

Just like electrons, the proton in the H atom also has a spin, which is described by an additional quantum number, m_p , and therefore also a magnetic moment. However, it is several orders of magnitude smaller than that of the electron.

- The energy difference between the two proton spin states in a magnetic field is 660 times smaller than for electron spin states!
- But... There are many more unpaired proton spins than unpaired electron spins in ordinary matter. Our bodies have many unpaired protons in H_2O . Detect them

In order to image tissue of various types, **Magnetic Resonance Imaging** detects the small difference in the numbers of “up” and “down” **hydrogen proton spins** generated when the object studied is placed in a magnetic field.
Nobel Prize (2003): Lauterbur (UIUC)

