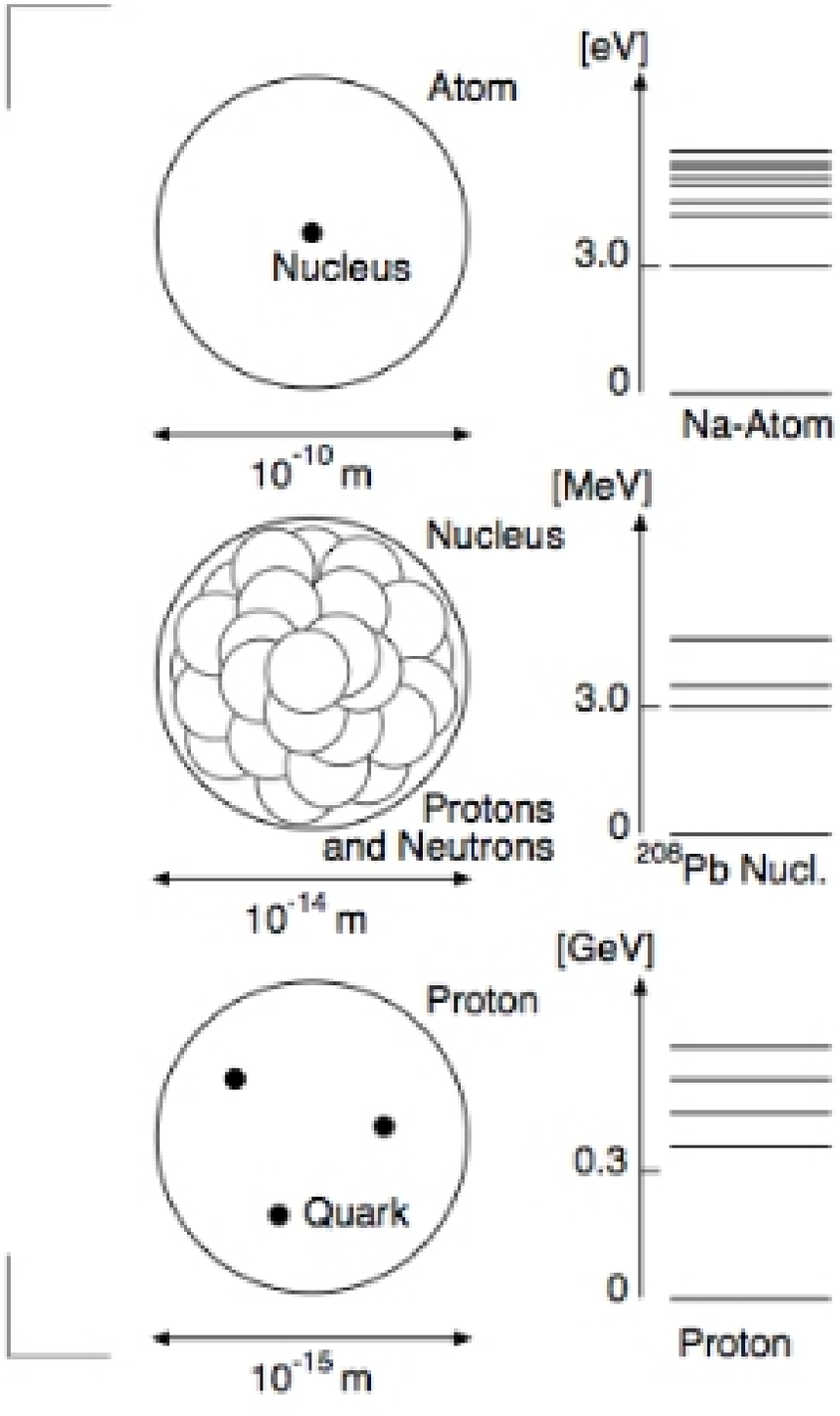
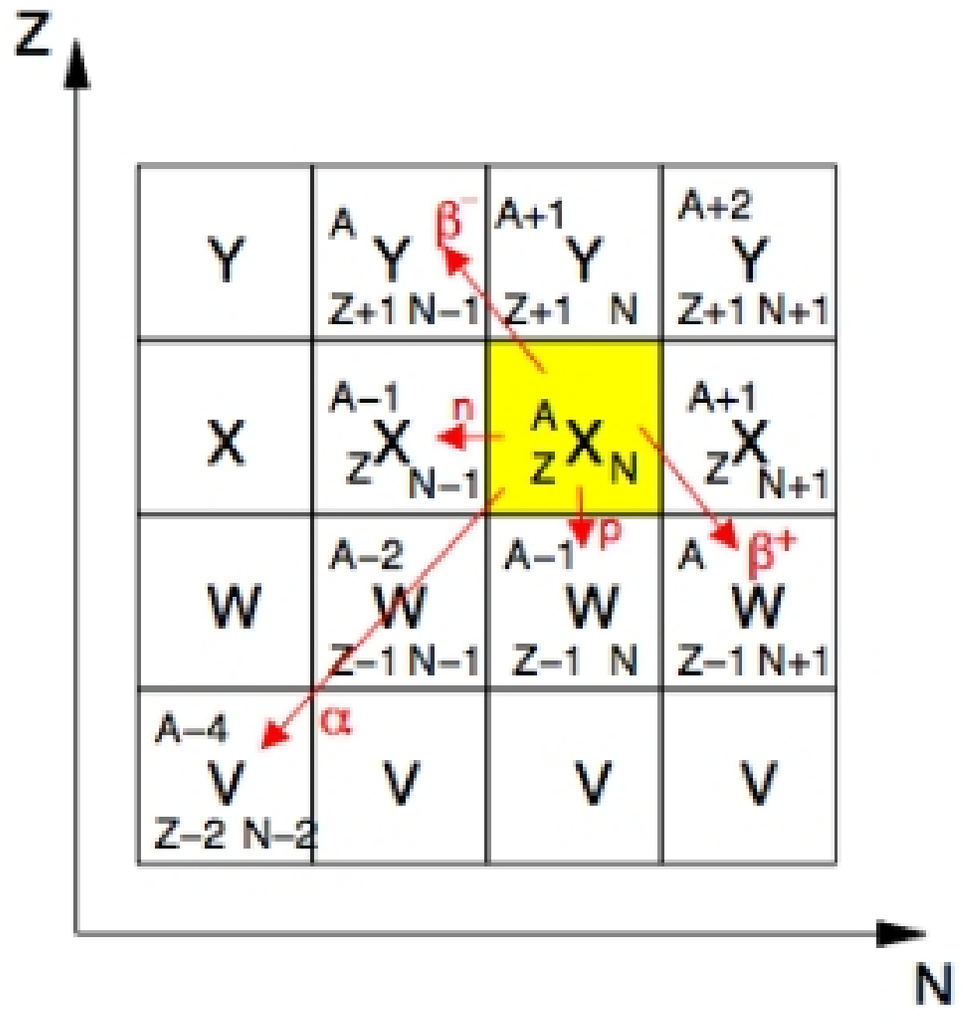
Nuclear Properties

The Nucleus



- Atoms consist of a nucleus and an electron shell.
- A nucleus consists of nucleons: protons and neutrons. As the mass of a nucleon is about 2000 times the mass of an electron the nucleus carries practically all the mass of an atom.
- A nucleon consists of 3 quarks (and gluons).
- 1 fm (femtometer, Fermi) = 10^{-15} m is the typical length scale of nuclear physics
- 1 MeV (Mega-electron volt) = $1.602 \cdot 10^{-13}$ J is the typical energy scale of nuclear physics

Nuclid Chart



- nuclids can be put onto a chart, not unlike a periodic table for nuclear physics
- typically the chart plots Z vs N
- the different radioactive decays can easily be connected with movement in the chart, e.g. α-decay corresponds to two-left, two-down.
- this allows to visualise entire decay chains in an effective fashion
- it also allows to visualise other properties, e.g. lifetime