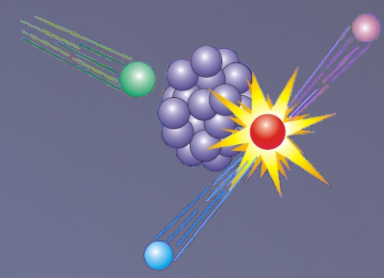
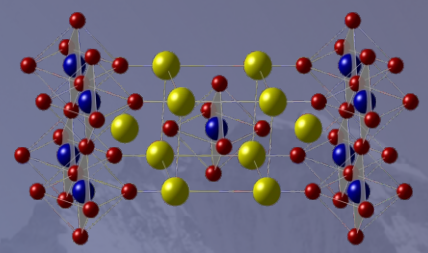
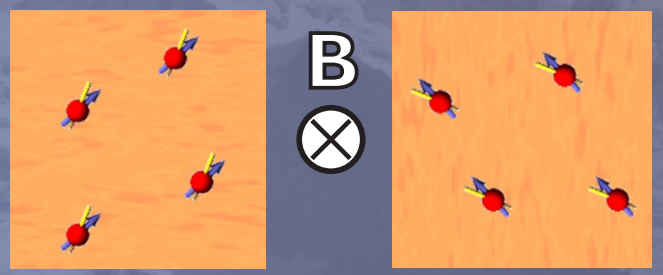
μSR, Basic Idea



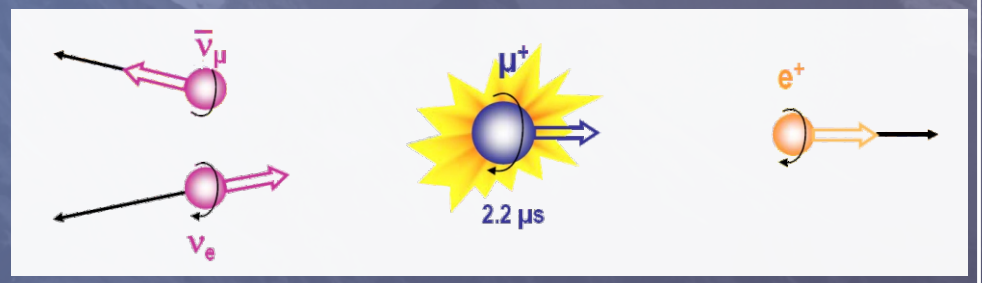
- Create a lot of 100% spin-polarized muons by shooting high-energy protons into a Carbon-target



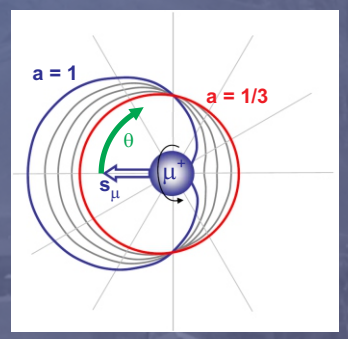
- Implant the muons into a sample of choice

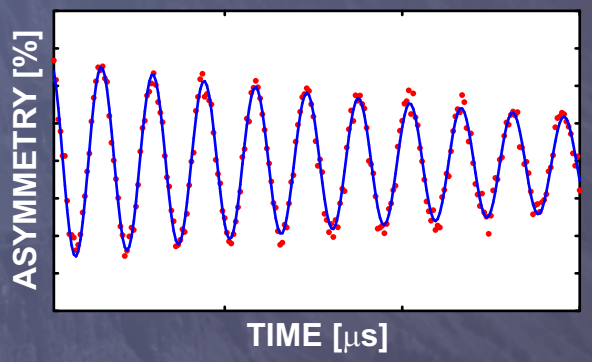


- The muons have a large gyromagnetic ratio (γ). It's spin start to Larmor-precess in very small non-parallel internal magnetic/nuclear fields



- After an average time of 2.2 μs the muon decay into a positron, preferentially emitted in the muon spin direction





- Measure the time and spatial distribution of emitted positrons = Asym.(t)

Reveals how the spin-direction of the implanted muons is affected by the sample i.e. muons are very sensitive local probes of static and/or dynamic internal fields !

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