

# Atomic physics

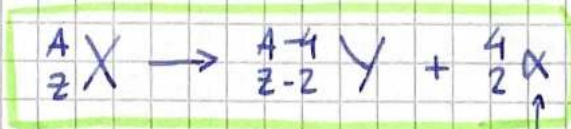
quantized = „quantisiert“

- **strong nuclear force**: force holding atomic nuclei together; very strong and short-ranged, involves  $[p^+ \text{ and } n]$
  - **weak nuclear force**: force explaining all aspects of an atom including beta emission; weak and short-ranged, involves  $[p^+, n, e^-, e^+, \nu]$
  - **gravity**: force of attraction between all objects that have mass; very weak, range is infinite
  - **electromagnetic force**: forces involving charged matter; relatively strong, range is infinite  
→ electrostatic, magnetic, friction, ...
- ↳ all the forces that exist (9)

# Radioactivity

radioactive decay:

$\alpha$ :



↑ helium nucleus

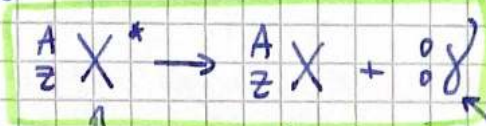
$\beta$ :



↑ electron

↑ antineutrino

$\gamma$ :



↑ excited state

↑ lower energy state

↑ electromagnetic radiation

radioactive decay is measured in Becquerels

$$1 \text{ Bq} = 1 \text{ decay/second}$$

Geiger counter, GMZ

(has GM tube)

background count, Nulleffekt

half-life  $T_{1/2}$ , Halbwertszeit