



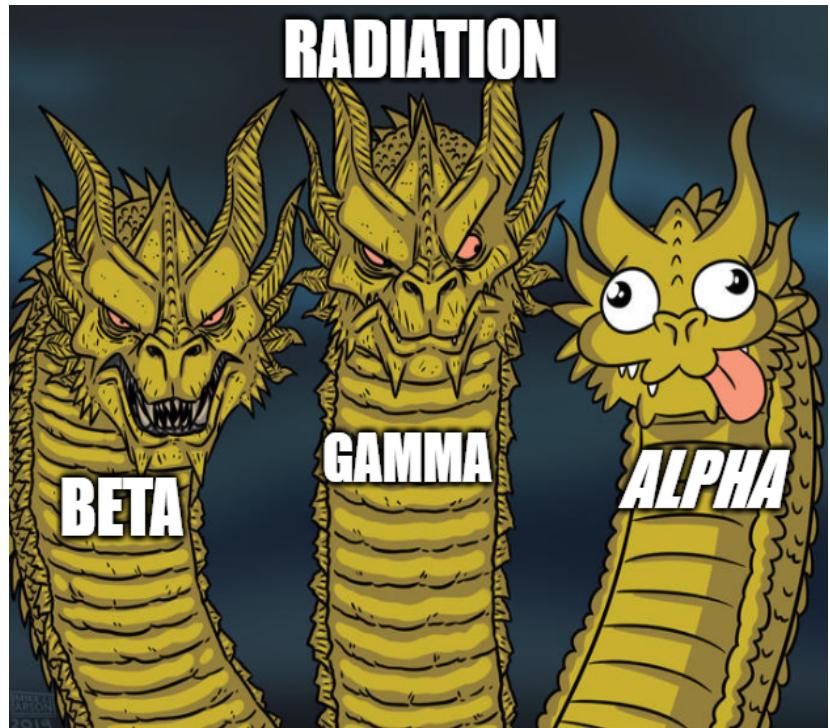
RADIOACTIVE DECAY

Why that meme?
Answer in the next slide!

Radioactive decay

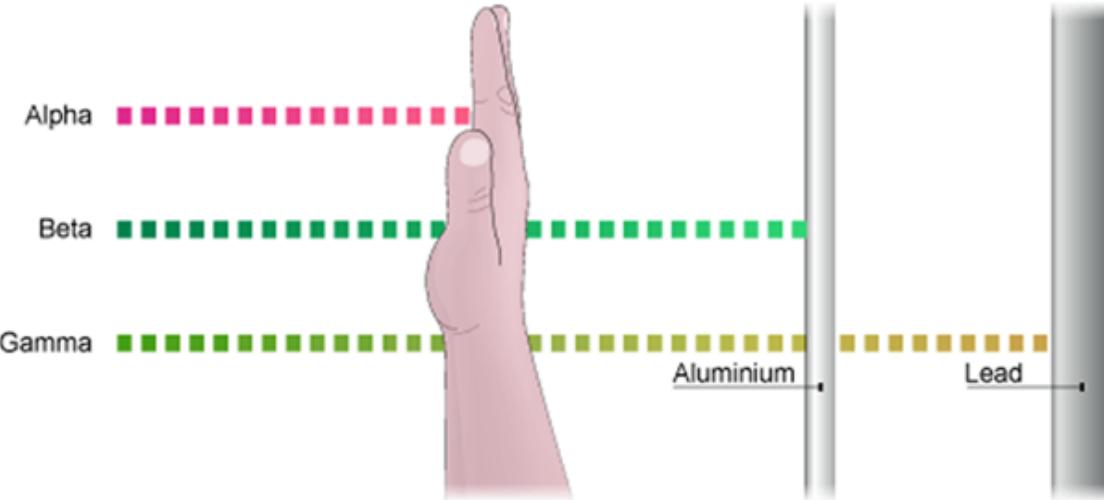
Many radioactive isotopes decay **spontaneously since their instability.** When an atom decays it **releases extra energy** in the form of small atoms, electrons or electromagnetic rays.

Every element has a **T time of decay.** After that time **half of the unstable atoms** of that element **decays.**

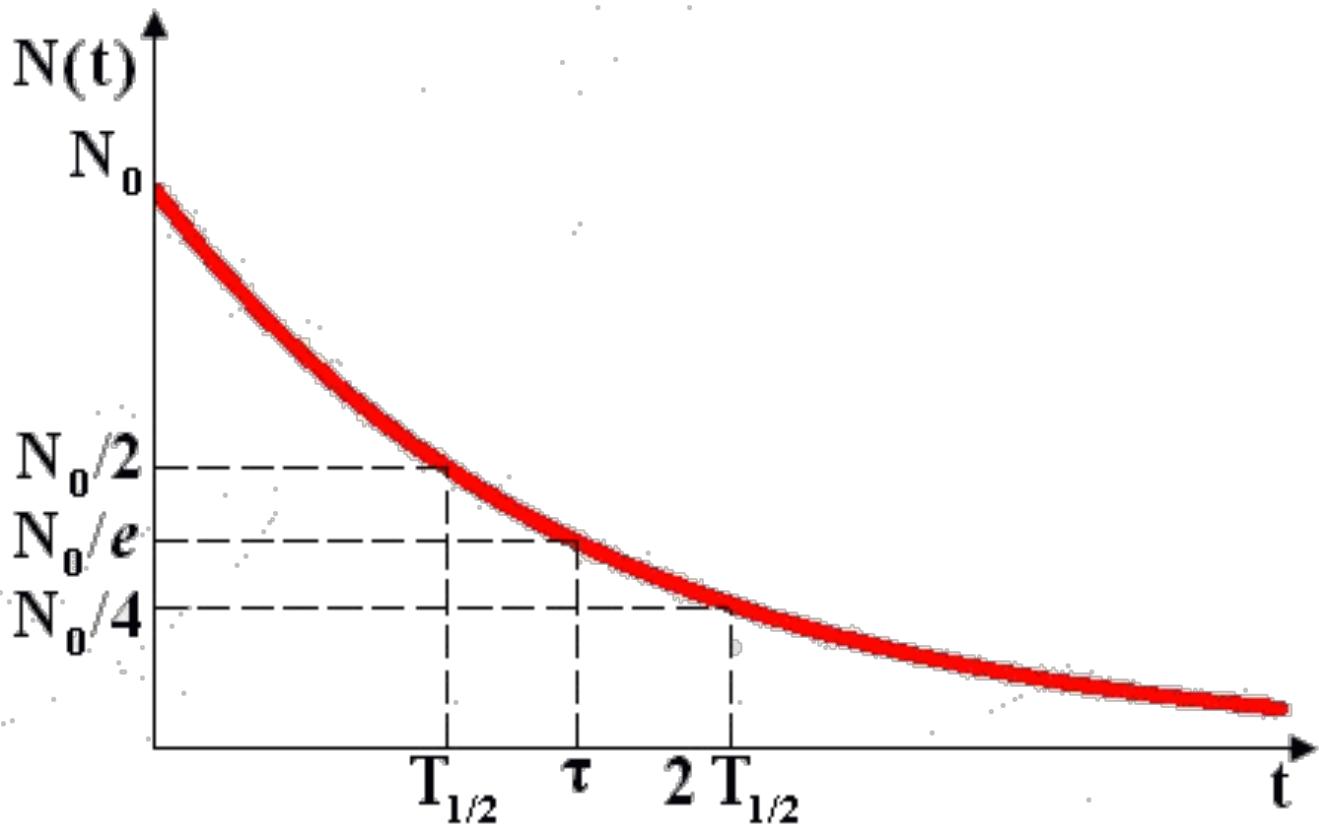


There are 3 types of radioactive decay

In all these cases radioactive (unstable) nuclei **lose their energy** by **radiation**



The decay time:
how old is this
body?



Alpha decay

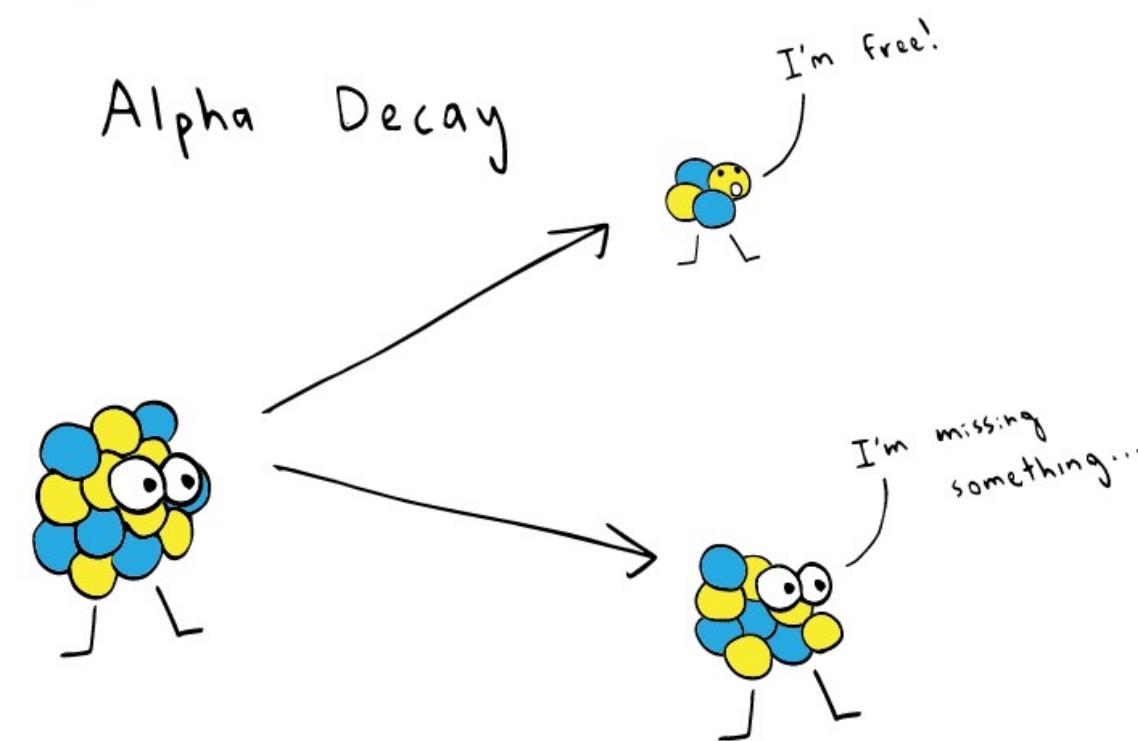


a decay

Alpha (α) decay produces an **alpha particle: composed by two protons and two neutrons.**

Alpha particle is a helium atom

After α decay an atom is divided into a helium atom and into **another atom which have two protons and two neutrons less than the previous atom.**



Beta decay



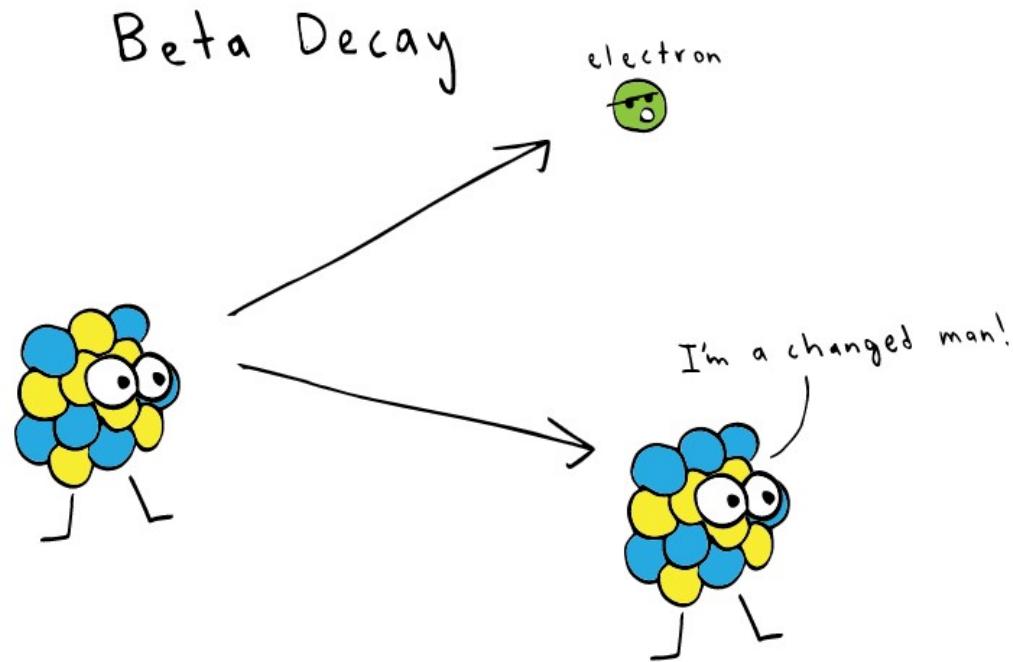
β decay

Beta is the type of decay that is characteristic of atoms whose nuclei, since they have an imbalance of neutrons compared to protons, **emits beta ray, which are nothing but fast electrons.**

How can a nucleus release an electron?

The neutron, when isolated, spontaneously disintegrate turning into an **electron and an antineutron.**

Beta Decay



Gamma decay



Oh no! gamma decay is happening	 Panik
Ok... atom didn't change	 Kalm
Wait: where is my foton?!	 Panik

γ decay

Gamma (γ) decay produces gamma radiation, made of **gamma rays**.

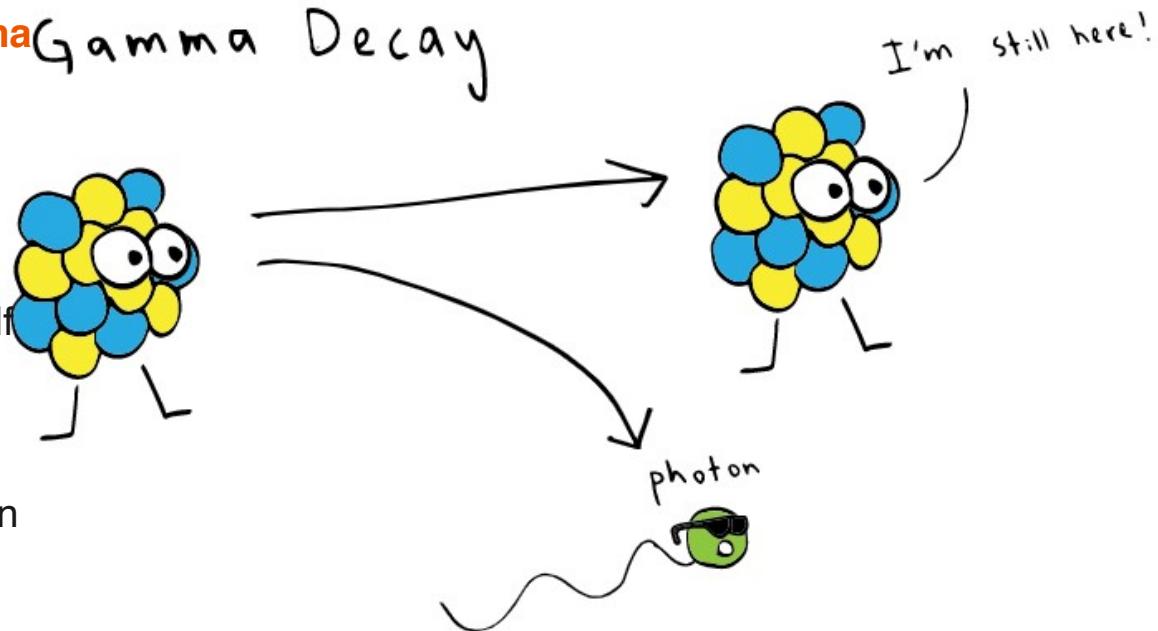
The latter are composed by **electromagnetic waves: electrons are emitted** at an extremely short wavelength.

That means that the nucleus itself does not change, but **its energy state** does.

It is the most penetrating radiation and the most dangerous for humans

LE RADIAZIONI
GAMMA SONO
INEFFICACI
NELLA
STERILIZZAZIONE
E DELLE
MASCHERE N95
(forrestgroupmine
rva.it)

P.E.T. uses gamma radiation to detect several diseases, such as cancer or epilepsy



ENERGIA ►

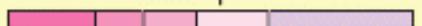
Frequenze in Hz

10^0 10^2 10^4 10^6 10^8 10^{10} 10^{12} 10^{14}

Basse frequenze

Alte frequenze

Onde lunghe, medie, corte, ultracorte, microonde



10^{16} 10^{18} 10^{20} 10^{22} 10^{24} 10^{26}

Raggi X

Raggi gamma

Radiazione secondaria di quota

Luce infrarossa - visibile - ultravioletta



Elettrodotti



Radio



Telefono cellulare



Calore



Luce



Radiografia



Radioattività

NON IONIZZANTE

IONIZZANTE