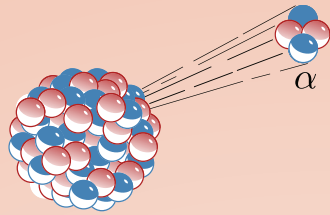


# Visualize Radioactive Decay

Can you spot these different types of radioactive decay?

LOOKS LIKE THIS IN THE CLOUD CHAMBER

## $\alpha$ -decay (alpha decay)



The nucleus emits two protons and two neutrons bound together in a particle identical to a helium nucleus. Alpha particles are heavy and only travel very short distances.

### USES FOR ALPHA DECAY



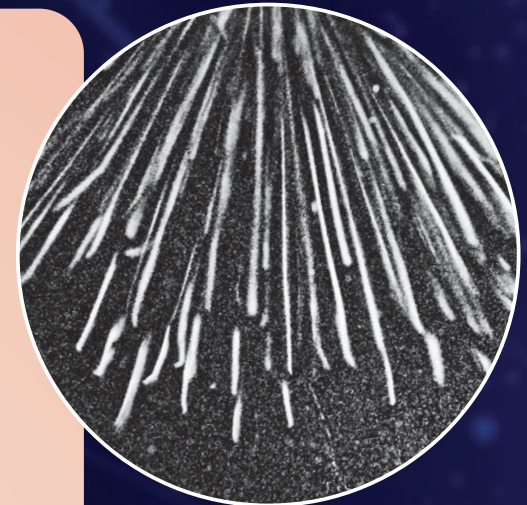
Alpha "seeds" inserted in tumors



Electricity and mineral testing in space vehicles



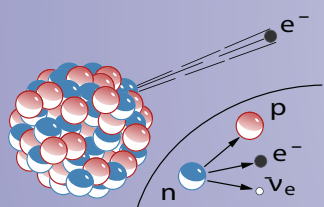
Power for drones



Short and fat trails

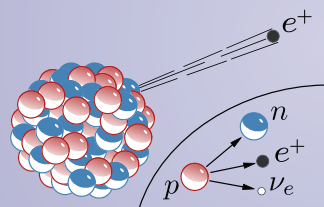
## $\beta$ -decay (beta decay)

There are two types of beta decay. In both, the nucleus emits a positive or negative particle. Beta can travel farther and penetrate about  $\frac{1}{2}$  inch into the body.



### $\beta^-$ decay

Neutron becomes a proton and emits a tiny, negatively charged particle like an electron



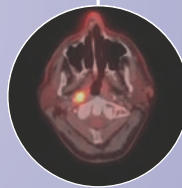
### $\beta^+$ decay

A proton becomes a neutron, and a positron, a tiny particle with positive charge, is emitted

### USES FOR BETA DECAY



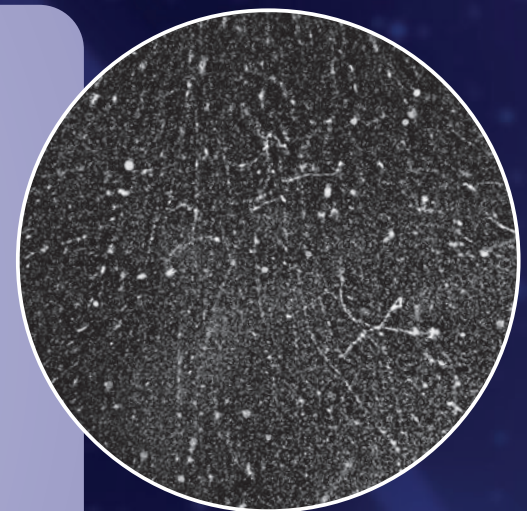
Carbon dating of artifacts



Positron Emission Tomography (PET) scan image

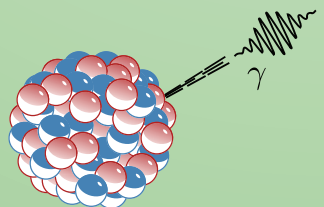


Measuring aluminum foil thickness



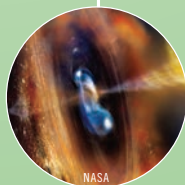
Fine, squiggly trails

## $\gamma$ -decay (gamma decay)



Gamma radiation is a ray of pure energy. The rays travel great distances at the speed of light and can penetrate many materials.

### USES FOR GAMMA DECAY



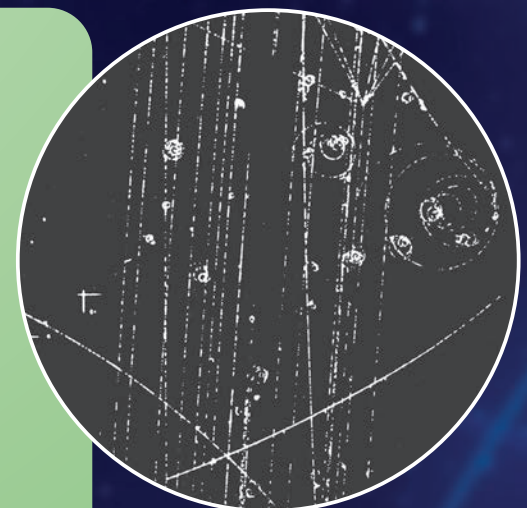
Deep Space Telescopes



Detecting flaws and cracks in materials



Sterilizing medical instruments



Leaves no trail, but affects other particles that leave trails