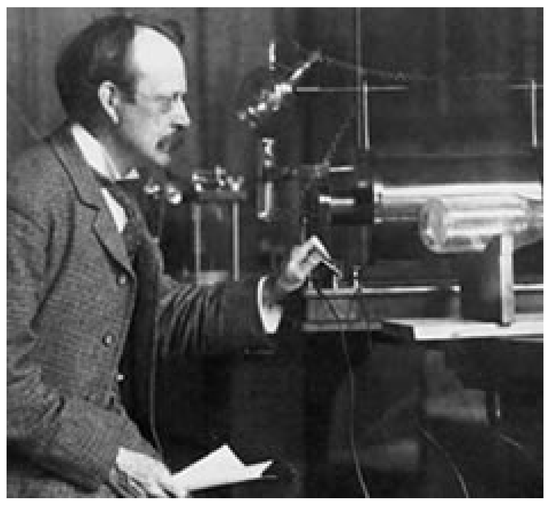
SCIENCE UP CLOSE

Particle Physics

STFC Rutherford Appleton Laboratory

Particle Accelerators: What are they good for?

Apart from making Higgs particles, that is?
Well, many things. Not so long ago, all televisions and computer screens used the simplest form of accelerator, a cathode ray tube.
Now, more than 30000 accelerators are used for a range of important applications. Some examples…..



JJ Thomson discovering the electron with the first ever cathode ray tube

Making better computers

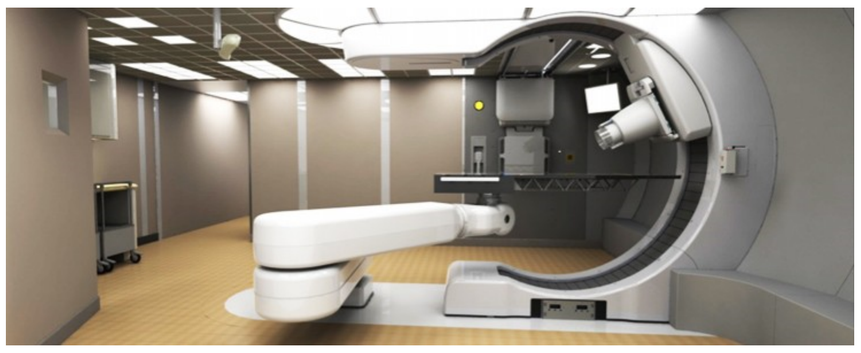
Accelerators are used to implant ions such as phosphorus and even arsenic in electronic devices to improve the way they work. This is big business and pretty much all digital electronics in phones, computers, etc are processed this way.

Example "ion implantation" facility

Treating cancer

Using beams of x-rays, electrons, protons, neutrons and even carbon ions

Radiotherapy with an x-ray beam created using an electron accelerator.



Radiotherapy with protons

Treating water and reducing acid rain

Commercial waste water treatment plant

Low energy electron beams are used for many things, including improving the properties of rubber, sterilising medical equipment and treating water to remove contaminants. They can also be used to reduce acid rain from power stations.

Medical imaging

Using accelerator produced radioisotopes

Accelerator for radioisotope production