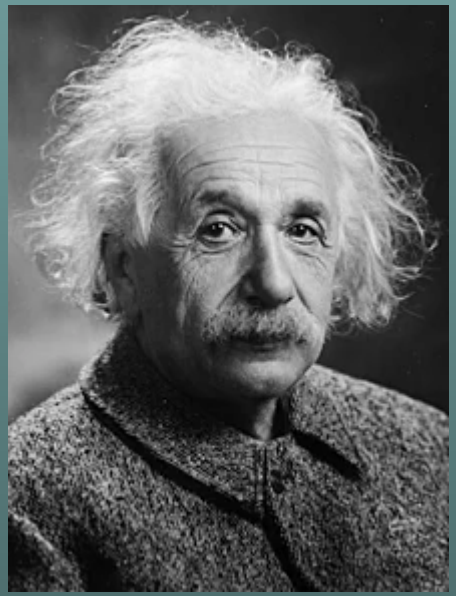
EINSTEIN AND URANIUM

AN INTERESTING RELATIONSHIP

WHO IS ALBERT EINSTEIN?



Albert Einstein (Ulma, 1879 - Princeton, 1955) was the most important physicist of the 20th century. He was interested to scientific subjects and in fact during his life he studied to engineering school in Zurigo. Then, he started to discuss about science and physics with other scientists.

But we probably know Einstein for his greatest study, starting from 1905, about the Theory of relativity, one of the essential bases of modern physics.

HIS LIFE IN AMERICA

Einstein, in 1933, travelled in America; but he was obliged to establish there because in this same year in Germany Hitler took the power and Einstein, for his jewish origins, couldn't return in his State.

While he was in America, in particular in 1939, he became in contact with some physicists, who knew that Hitler was planing a new arm: *a bomb based on uranium.*

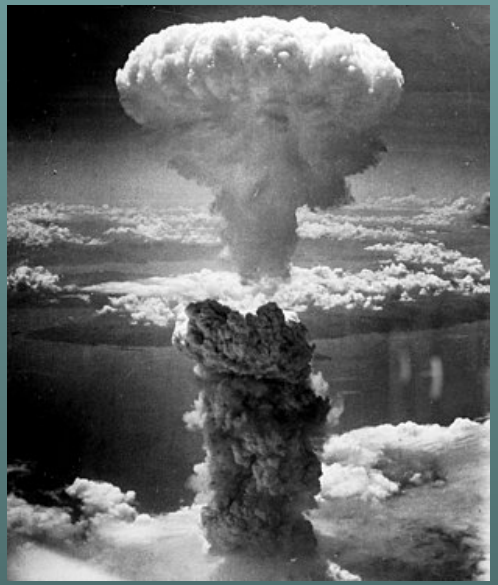
This brought Einstein himself and some physicists of the future "Manhattan project" (in particular the physicist Szilard) to inform the american president F. D. Roosevelt with a letter: in fact, they wanted to begin a study on the atomic bomb.

THE LETTER

The document was written on 2nd August, 1939. This letter wanted to draw Roosevelt's attention to the importance of uranium. Einstein and Szilard presented to the president that with a nuclear reaction, starting from a mass of uranium, it was possible to create new elements, from which originate new powerful and destructive bombs. With the letter, the physicists showed their fears about the danger of this new arm and asked for help to the american State to contrast the German activity, starting the same study.

THE AMERICAN INTERVENTION

In America there was not a great concentration of minerals rich of uranium: the most important uranium sites were in Canada and in particular in Belgian Congo. So, with the letter, Einstein wanted to create a connection between American government and the physicists who were working on this reaction in order to obtain these minerals.
Their purpose was to study the uranium and the bombs based on this element to be ready to every form of attack: in fact only a nuclear uranium bomb, transported on a boat in a port, would destroy all the port and also part of the surrounding territory.



THE PLAN OF THE WORK

To realise physicists' request, the government should elect a trustworthy man who controlled the work. The plan of the work was divided in two points, for Einstein:

- keep in contact with other Departments interested to this study to know possible development and to control the correct supply of uranium for America;
- to increase the experiments and ask, if it is necessary, some more budgets or enter in co-operation with some industrial laboratories, which have more suitable equipment.

This activity was the starting point of the "Manhattan project" in America.

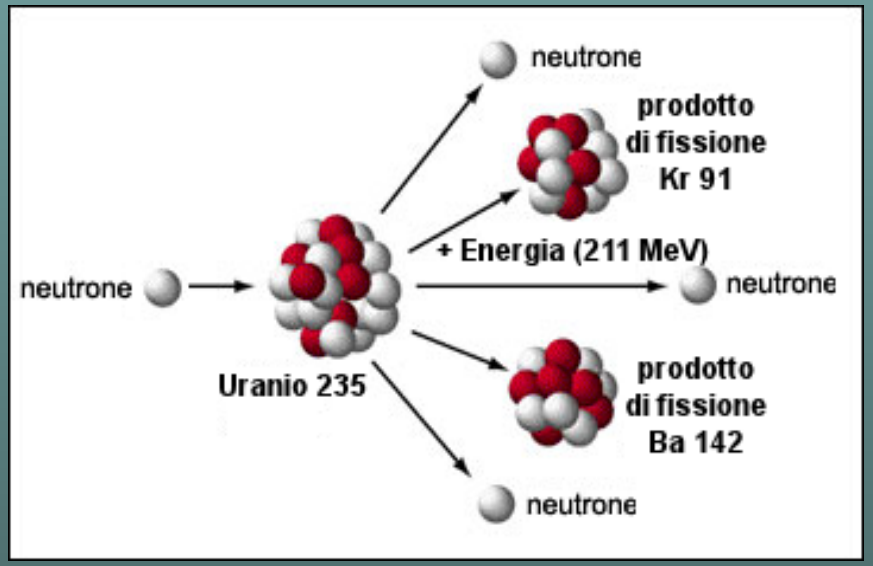
WHAT IS URANIUM?

The uranium is the number 92 of Periodic Table of elements and was discovered in 1789 by the chemist Klaproth. It is the one of the most important radioactive element in nature, but its radioactivity was known only in 1896.

- it is a shiny white metal
- it is characterized by a great density
- it is malleable

The importance of the uranium increased when some physicists who were part of Manhattan project discovered the nuclear fission and in particular the uranium fission.

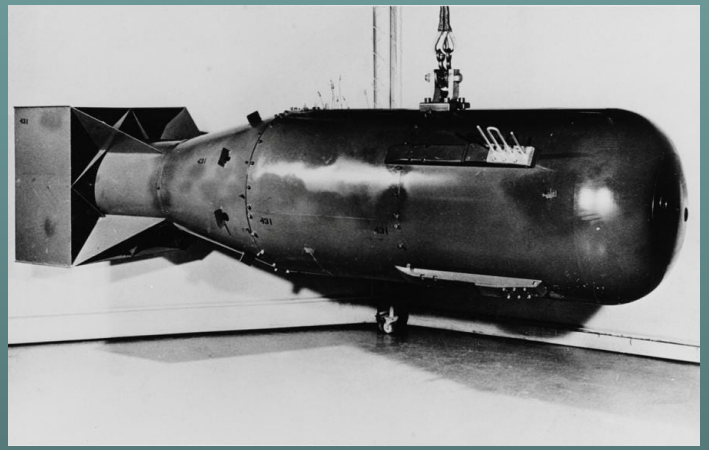
THE URANIUM FISSION



This phenomenon starts from the concept of nuclear fission, that is the fragmentation of a nucleus in different nuclei with the emission of energy. In the same way, when the atom of uranium 235 (an isotope of the uranium) becomes in contact with a neutron, it divides itself in more atoms, creating two or three neutrons and releasing kinetic energy.

URANIUM USE IN THE ARMS

The most famous use of the uranium in military field is the atomic bomb during the Second World War, created by the “Manhattan project” itself. It was a bomb formed in particular starting from nuclear fission of uranium and was a terrible bomb: we all know the disasters of Hiroshima and Nagasaki.



An atomic bomb