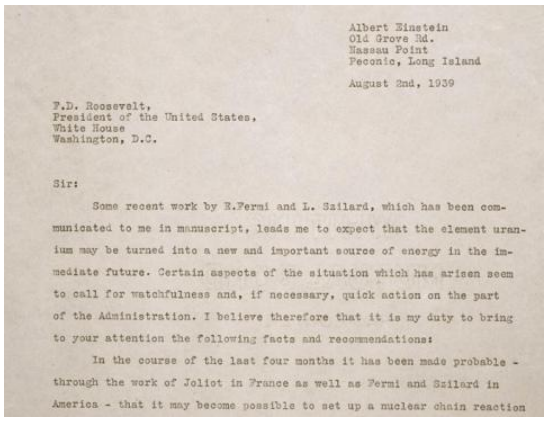
AWESOME stories

EINSTEIN'S LETTER



Albert Einstein
Old Grove Rd.
Nassau Point
Peconic, Long Island

August 2nd, 1939

F.D. Roosevelt,
President of the United States,
White House
Washington, D.C.

Sir:

Some recent work by E.Fermi and L. Szilard, which has been communicated to me in manuscript, leads me to expect that the element uranium may be turned into a new and important source of energy in the immediate future. Certain aspects of the situation which has arisen seem to call for watchfulness and, if necessary, quick action on the part of the Administration. I believe therefore that it is my duty to bring to your attention the following facts and recommendations:

In the course of the last four months it has been made probable - through the work of Joliot in France as well as Fermi and Szilard in America - that it may become possible to set up a nuclear chain reaction

In an event which changed the world, Albert Einstein wrote a letter to President Franklin D. Roosevelt on August 2, 1939. This image depicts the beginning of that letter. It is online via the U.S. National Archives.

All matter is made up of atoms. The central body of an atom is called a nucleus. The nucleus consists of protons (positively charged particles) and neutrons (particles with no electrical charge). Electrons (negatively charged particles) are located outside the atom's nucleus.

Greek scientists always believed that the atom could not be divided. The word, "atom," comes from a Greek word which means "cannot be divided." But one form of a naturally occurring atom (uranium), is different. It can be mined, reconstituted to form a substance called "yellowcake," and then enriched (by chemical process) to create a type of uranium isotope called U-235.

Uranium 235 is the *only* type of uranium, or naturally occurring substance, which can break apart. It can split because the nucleus of U-235 is unstable. When it breaks apart, the atom's neutrons are released. When those "on-the-loose" neutrons hit other U235 atoms, they *also* split.

The splitting of those atoms is called "fission." Fission (in a chain reaction) releases more neutrons plus heat.

The discovery of fission by German scientists, in 1938, led Einstein and, especially, his colleague Leo Szilard (a Hungarian scientist working in the U.S.) to worry that Germany could create a new type of bomb. (That same year, Americans throughout the country were extremely worried that a "War of the Worlds" - actually just a radio play dramatized by Orson Welles and his colleagues - was a real event about to catapult the nation into chaos.)

Concerned, and at Szilard's urging, Einstein signed a pre-written letter to President Roosevelt on August 2, 1939. In it he observed, among other things:

> *In the course of the last four months it has been made probable - through the work of Joliot in France as well as Fermi and Szilard in America - that it may become possible to set up a nuclear chain reaction in a large mass of uranium, by which vast amounts of power and large quantities of new radium-like elements would be generated. Now it appears almost certain that this could be achieved in the immediate future.*

Beyond the theoretical idea of creating power, from splitting atoms, was the very real concern that Germany could develop a nuclear bomb:

> *This new phenomenon would also lead to the construction of bombs, and it is conceivable - though much less certain - that extremely powerful bombs of a new type may thus be constructed. A single bomb of this type, carried by boat and exploded in a port, might very well destroy the whole port together with some of the surrounding territory. However, such bombs might very well prove to be too heavy for transportation by air.*

Einstein also did something else in this historically significant letter (which President Roosevelt first learned about two months later, on October 11). He suggested that the U.S. government get involved, to some extent, in the process:

> *In view of this situation you may think it desirable to have some permanent contact maintained between the Administration and the group of physicists working on chain reactions in America.*

As the old adage goes: "Once you invite governments in, it's pretty hard to get them out."

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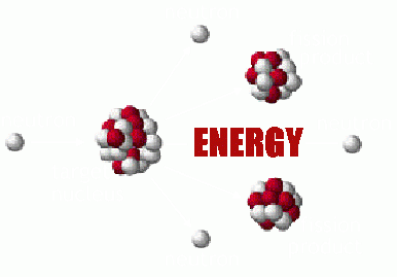
Media Stream



Fission Process

Image from University of Chicago, Metallurgical Lab. Online, courtesy the Atomic Heritage Foundation website.
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Einstein and Leo Szilard

Image online, courtesy U.S. National Archives.
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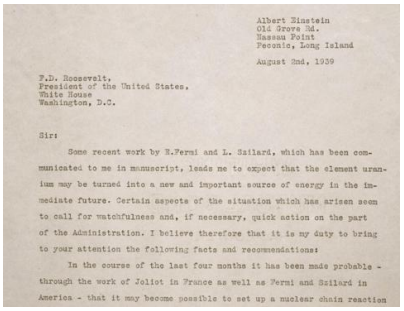

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EINSTEIN'S LETTER

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Electrons - Particles or Waves?

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The Night that Panicked America - Part 2

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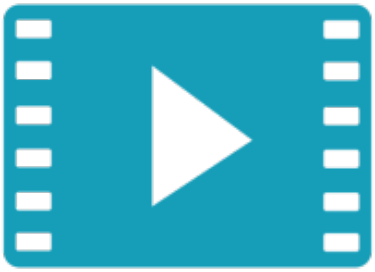

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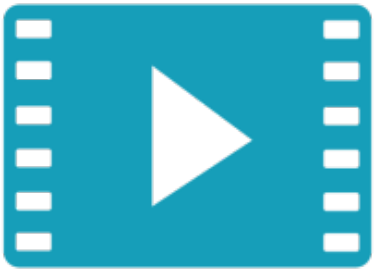

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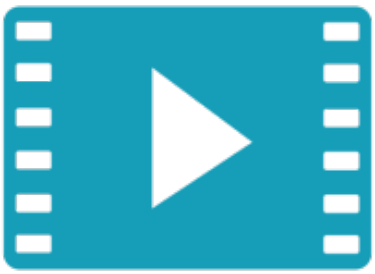

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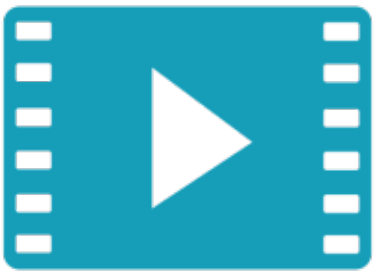

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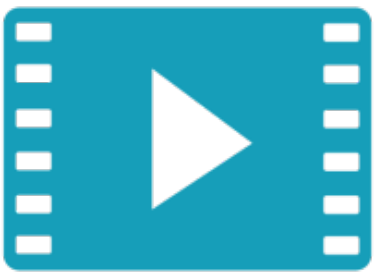

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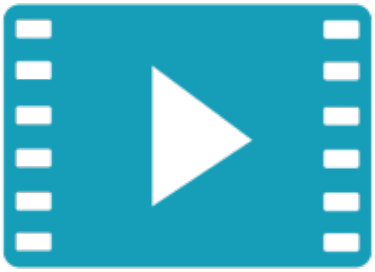

The Night that Panicked America - Part 8

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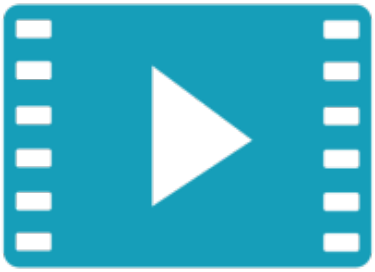

The Night that Panicked America - Part 9

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