

ALBERT EINSTEIN

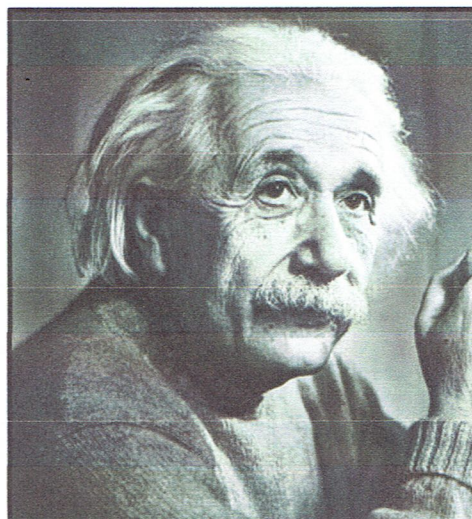
(1) With my white hair and mustache, I am one of the most widely recognized scientists in the world. Despite my fame, very few people understand the ideas that have made me famous. Most people associate me with developing the iconic equation, $E=mc^2$, as well as the theory of relativity, but ironically many don't understand the significance of these ideas.

(2) I was an Ashkenazi Jew born in Ulm, Germany on March 14th 1879. I was a quiet child and didn't talk much until the age of three. Some thought I was slow, but I was just waiting for something interesting to say. My family's electric equipment business failed when I was 15 and that's when they moved to Italy. I stayed in Munich to complete my studies. My father wanted me to become an electrical engineer but I had problems with authority and had a few run-ins with the cops. I also really disliked the way school was taught. I hated the emphasis on learning through repetition instead of through creativity. I even faked a doctor's note so I could travel to Italy to see my family. I was not the model child nor student.

(3) In 1895, when I was 16, I wrote an entrance exam to get into the Swiss Federal Polytechnic in Zürich, Switzerland. I failed the general part of the exam but I got exceptional marks in the math and physics sections. At 17, I enrolled at the Zürich Polytechnic for a four year degree in math and physics. Here I would meet my first wife, Mileva Marić.

(4) 1905 was an immensely productive year for me. Creative and visionary ideas danced in my head constantly. I was 26 and this is when I would come up with most of my greatest theories. I wrote four hugely influential papers on Brownian motion, the equivalence of mass and energy ($E=mc^2$), the photoelectric effect and special relativity. In 1915, I published a paper on the general theory of relativity.

(5) It's difficult to explain the complicated theory of relativity, so for now let's just look at one interesting idea that comes from it. Fast moving objects experience time passing more slowly compared to slow moving objects. This idea has been used in many science fiction books and movies. If a very fast spaceship leaves Earth on a mission to another planet and then returns to Earth, the crew will have barely aged, but the people on Earth will have grown much older. Since the crew moved so



Albert Einstein
Physicist (1879-1955)

quickly, time passed slowly for them relative to the time experienced by the people on Earth. The crew may have only experienced a 2 month mission before its return, while the people on Earth waited 30 years to see them again. Crazy...but it's true.

(6) $E=mc^2$ has become the world's most famous equation. Put into words, this means that the energy in a piece of matter (E) is equal to the mass of the matter (m) multiplied by the speed of light squared (c^2). This means that even a small amount of matter contains a huge amount of energy. You can imagine how much energy a small bit of matter could release if multiplied by the speed of light squared! I was very excited by this idea, but was unprepared for how it would be used later in World War II.

(7) In 1933, the Third Reich (Nazi Germany) came into power under the dictatorship of Adolf Hitler. By this time, I had already divorced my first wife and married Elsa Löwenthal. I had also received a Nobel Prize in Physics in 1922. By the 1930s I was an international celebrity and welcomed warmly to many countries. However, back in Germany, the Third Reich had created many anti-Semitic (anti-Jewish) laws including barring Jews from teaching in universities. Books I had written were being burned in the streets and there was even a \$5000 bounty for my head. Many countries offered to take me and Elsa and in

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1935, we decided that we wanted to be in America. Princeton University immediately offered me a job at their Institute for Advanced Studies and I held this position until I died.

(8) World War II was when my formulation of $e=mc^2$ was used to develop nuclear weapons. The equation made scientists realize that within the mass of an atom (its nucleus) was a huge amount of energy. If this energy could be released, it could create a tremendous destructive force which could be used as a weapon. I was getting very worried by reports that the Nazis were conducting research to make their own nuclear bombs. Though I was a pacifist (opposed to violence and war), I convinced Franklin D. Roosevelt to support the Manhattan Project, which was a group of scientists who wanted to develop nuclear

weapons before the Nazis could. The Nazis never ended up developing the bomb and surrendered on May 8th, 1945. However, Japan, who had been an ally to Germany, had yet to surrender. The Manhattan Project was successful in developing nuclear weapons and on the 6th of August 1945, a nuclear bomb, codenamed "Little Boy", was dropped on the Japanese city of Hiroshima and three days later another bomb, codenamed "Fat Man", was dropped on Nagasaki. The destruction was unlike anything we had ever seen on Earth before or since. In an instant over 130 000 people were immediately killed and many more were left to die over the next few years due to injuries. I was not a part of the Manhattan Project, but I was key to its creation. My support of the Manhattan Project was the biggest regret of my life.