

Shivangi Patel

Period 5

### Albert Einstein

A German theoretical physicist by the name of Albert Einstein was born on March 14<sup>th</sup>, 1879. He is known for his theory of relativity and mass-energy equivalence whose equation is expressed as  $E = mc^2$ . He grew up in a Jewish family and his father was an engineer and a salesman. Albert attended a Catholic elementary school and was a top student in his class. He developed an interest for math as a young child. Einstein enjoyed building models and mechanical devices for fun once his father gave him a compass. He questioned how it was able to work. Through a family friend, Einstein learned the basics of science, mathematics, and philosophy. He was able to do Euclidean geometry by age twelve. He was put in a program to pursue a career in electrical engineering by his father. He had to move to Italy because his father's business failed and at age fifteen, Albert wrote his first scientific work. While in high school, Einstein left Munich to be with his family in Pavia. He dropped out and applied to a technology institute in Switzerland but was denied because he didn't pass the entrance exam. He had to finish high school and later attended ETH along with his future wife, Marie who was the only woman studying mathematics. Albert received a physics degree from ETH in 1900. Because he couldn't find a job after graduating, Einstein had to work as an assistant examiner and has to evaluate patent

application as Federal Office for Intellectual Property in Berne. In 1902, Albert and Mileva had a daughter and later got married in January of 1903. They later also had two sons but divorced in February of 1919. In June, Albert married his cousin, Elsa. By 1905, Einstein had published four papers. The first was on the particulate nature of light, the second on the explanation of the random movement of very small objects, the third on electrodynamics of moving bodies, and the last on mass-energy equivalence. They all are now recognized as outstanding works of physics. In 1910 he wrote another paper that explained cumulative effects of light by molecules in the atmosphere, for example, why the sky is blue. He became a professor at Charles University of Prague where he wrote a paper on the effects of gravity on light. It was publicized by a German astronomer, Erwin Prinsley-Freundlich, for all other scientists around the world to see. When he accepted a job at ETH, he met Marcel Grossmann, a mathematician, who introduced Riemannian geometry to him. He decided to take another observation of his gravitational theory when he realized there would be problems with it. Albert then published a theory of relativity book in 1915 which is still used today. It explains gravitation as distortion of the structure of space-time by matter. In 1914, as a new member of the Prussian Academy of Sciences, Albert also became a professor at Humboldt University of Berlin. He was announced director of the Kaiser Wilhelm Institute for Physics until 1932. His speeches and writings were not available to everybody during World War I. Once the war ended, Einstein was rewarded with an Extraordinary Professor contract which allowed him to travel to Holland between

1920 through 1930 for lectures. His article published in the *Physikalische Zeitschrift* in 1917 shows the possibility of stimulated emission. And also published a work on introducing notion into the general theory of relativity in an attempt to model the behavior of the entire universe. This was the year when Einstein's works were taken into consideration by astronomers. In 1918, Einstein's prediction was announced poorly proven by the Lick Observatory. A British astronomer, Arthur Stanley, confirmed that his predictions of gravitational deflection of starlight by the sun matched Einstein's. Albert Einstein was awarded the Nobel Prize in Physics in 1922 at age 42 for his services to Theoretical Physics and the discovery of the law of the photoelectric effect which was written in his 1905 paper. His first visit to the United States was on April 2<sup>nd</sup> 1921 in New York City. He was presented with a description of a statistical model from Satyendra Nath Bose, who assumed that light could be understood as a gas of indistinguishable particles. The Bose-Einstein phenomenon is now used to describe the behaviors of any assembly of "bosons". Erwin Schrodinger requested that Einstein co-author his name in his thermodynamic properties of a semi classical ideal gas but he denied the invitation. In 1926, a former student of his and Einstein were credited with the Manhattan Project of the discovery of chain reaction. They also had co-invented the refrigerator to what Einstein made into one that only uses heat as an input. Albert was not happy with Niels Bohr's quantum theory and formulated thought experiments against it. He made a further analysis with Boris Podolsky and Nathan Rosen which is known as the EPR

paradox. Due to his question of scientific determinism, Einstein was questioned if he believed in God. He clarified in a letter that he believed in a Judeo-Christian God. He saw science as two of his three styles of religion and stated that they were partnered in with the third. He was a humanist and a Ethical Culture supporter and served on the board of the New York First Humanist Society. In 1940 he published a paper entitled *Science and Religion* where he expressed how he believed the each sprung from fatal errors. He raised money in the 1930s for Zionist organizations, because he opposed nationalism. An anti-Einstein man was planning to kill Albert and was fined six dollars. He was a United States citizen since 1940 and remained there regardless of his Swiss citizenship. Leo Szilard and Einstein wrote a letter to Franklin D. Roosevelt asking him to conduct a weapon. Roosevelt began to harness nuclear fission after the request.

Albert and his wife, Elsa, bought a house in Princeton where Elsa died in 1936. Einstein was still an integral contributor to the Institute for Advanced Study until he died on April 17<sup>th</sup>, 1955 at age 76. He had internal bleeding by the rupture of an aortic aneurysm. He died at Princeton Hospital. The pathologist removed Albert Einstein's brain in hope of knowing what made him so intelligent. Albert was titled Person of the Century in 1999 by Time magazine.