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### Steven Chu

Steven Chu is a very well known physicist in the United States of America. Chu is also in very close relations with the government. That is because Chu is part of the U.S. government. Steven Chu is currently the Secretary of Energy for the U.S.A. Prior to gaining this powerful position; Chu earned a Nobel Prize in the field of physics. He studied physics and mathematics at Rochester before combining his two passions into one.

At Berkeley, he studied theoretical physics. Chu had decided that theoretical physics was the most obvious choice for combining math and physics. However, he quickly realized that experimental physics interested him much more than the aspects of theoretical physics. He spent two months playing in the lab instead of working on the theoretical physics problem he had been given. Thus, he contacted his advisor; they agreed he was much better suited for experimental physics.

Immediately after switching into the field of experimentalism, he became part of a project involving the use of lasers. It is here that Chu begins his work with lasers; he will win his Nobel Prize for an experiment highly involving lasers several years later. Steven Chu broadened his view of physics while working at Bell Laboratories, and then became the head of the physics department at Stanford. While at the Bell Labs, he worked on an experiment involving the trapping of atoms using laser cooling.

This experiment is the reason Steven Chu was awarded the Nobel Prize in Physics for 1997. Normally, an atom will move at speeds much greater than 500 m/s in a vacuum. At this speed, an atom is impossible to observe no matter how precise the tool one uses. Chu's work allowed scientists to slow the atom down, observing the pattern of its movement in a much more definite way, as well as observing the atom itself. Steven Chu's experiment with the cooling of atoms not only led to his Nobel Prize, but led to many more great discoveries in the field of particle physics, due to the more in-depth ability to inspect the atoms.

This experiment was a success in large part to its location. The experiment took place in the Bell Labs, whose management with an ample amount of resources. The Bell Labs were owned by the American Telegraph & Telephone Company (AT&T), which has been and is one of the largest corporations in America. This allowed Steven Chu to experiment very deeply with his hypothesis, and after years of experimentation, achieve his goal. Chu successfully slowed an atom down to a rate at which its motion could be observed, which was his original goal. Scientists had known that atoms moved in a wavelike path, but had no easily observable demonstration of it until Chu's findings.

Steven Chu actually carried out this experiment starting in 1985. This was during a scientific rush in America. NASA was making major strides at the time, although it did have the tragedy of Challenger during 1988. Biology started the human genome project funding in 1988. These surges of science in the United States of America led to a great deal of interest in the basic structure of life, the atom. Atoms were known to have been all around us, and the basic structure had been hypothesized, but other than that, information was limited. This scientific decade led to the inquiry into the atom, which had implications in physics, chemistry, and biology.

Steven Chu had been looking to slow down atoms for many years, it was no accident. Chu saw a task that needed to be completed for further progression in the subject of particle physics, and he did it. His experiment was not by any means easy to come up with, or carry out.

The experiment first required shooting photons with a laser into an atom. The atom would absorb the photons, cooling it and slowing it down. It needed to absorb thousands of photons in order to reach a reasonable speed. Hypothetically, this could be achieved in milliseconds. However, these photons needed to be absorbed near head-on to slow the atom down. In turn, the atom would accelerate if it collided with protons from behind. These circumstances made the experiment a very tedious one. With a lower temperature, the atom moved slower (due to less kinetic energy in the atom). The atom was then essentially a “captured atom”. These “captured atoms” were frozen in a light laser, where they could be observed. In Chu’s case, sodium atoms were moving in a vacuum near 570m/s. Photons were fired nanometers in front of the atom, causing it to lose momentum. The momentum would drop at an exponential rate, until virtually reaching a freeze.

After his work on the freezing of atoms, Steven Chu settled down as a professor at Stanford. He continues scientific work, but not nearly as significant as his work at the Bell Laboratories. In the 1990s, however; Chu begins to apply his ability to work with atom sized molecules to the field of biology. He finds himself next to a Ph.D student, Steven Kron, who introduces him to molecular biology during the evenings. Chu uses his expertise to study DNA samples close up. He makes discoveries at Stanford in biology, as a physicist, just again increasing his scientific reputation. He noticed that identical molecules will undergo unique changes to that molecule, but with the same common goal of reaching a state of equilibrium. His

career stayed a quieter yet still brilliant life as a college professor until an even more prestigious opportunity beckoned.

Steven Chu was appointed Secretary of Energy for the United States by newly elected President Barack Obama. Chu is currently a member of Obama's cabinet. This means, Chu is technically in line for presidency was something to happen to many other members of that cabinet. That is still a big step for anyone with no political background, even the prodigy that is Steven Chu. Chu will someday become a famous dead guy, and be remembered for the great strides in physics that he accomplished. Who knows? He's changed from theoretical to experimental physics, and even had success in the field of Biology. Ten years from now, he could be doing the unimaginable (leading the French to a war victory). Chu is one of the younger recipients of this award, so unlike many winners, he still has quite a scientific future ahead of him.

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