An Exploration of Antimatter by Observation of Alpha and Beta Decay within Three Distinct Cloud Chamber Apparatuses

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This science fair project is an exploration of the mysterious, elusive substance of antimatter. Research has been conducted about what is currently understood about antimatter and the state-of-the-art technology that is being used to study it. One of the few natural processes that produces antimatter is radioactivity, which this project has taken advantage of. The experiment performed consists of a simpler, but still effective, form of technology called a cloud-chamber in which various subatomic particles can be observed that constitute the different types of radioactive decay. To do this, a radioactive needle containing Strontium-90 and a lantern mantle containing Thorium-232 were placed within three different cloud chamber apparatuses to observe beta/alpha particle emissions. Each apparatus was then tested to determine which one was the most effective. Through observation, a Petri-dish apparatus was deemed most effective. By observing and studying the subatomic particles that facilitate alpha and beta decay, a better understanding of antimatter should be achieved. I believe solving the mysteries of the universe is essential for humanity's quest for a greater understanding of who we ultimately are. Also, if antimatter is fully understood, humanity may be able to reconcile quantum mechanics and general relativity to create the "ultimate theory of everything." As time passes perhaps we will truly comprehend the basic physics that governs our universe and maybe… just maybe, we humans, who live less than a century at most, will be able to grasp the scale and complexity of our universe.

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