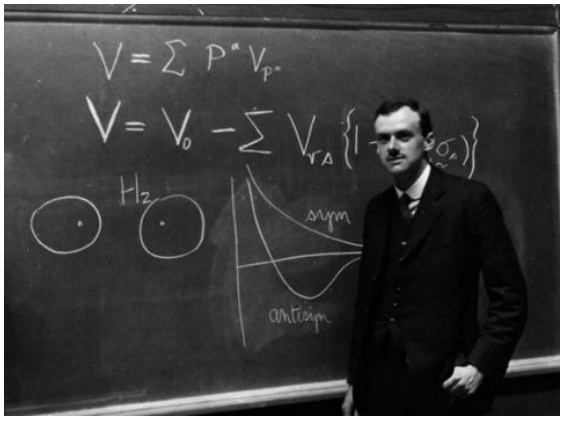
Paul Dirac - Discoverer of Antimatter



Paul Adrien Maurice Dirac (1902-1984), a British physicist known as a man of few words, developed a stunning equation in 1928. His ideas led to today's work in antimatter. According to *The Physical World*:

> *In 1928 Dirac took an important step towards bringing quantum physics into conformity with Einstein's special theory of relativity by devising an equation (now called the Dirac equation) that could describe the behaviour of electrons at any speed up to the speed of light. This equation provided a natural explanation of one of the electron's intrinsic properties - its spin.*
>
> *Taking the mathematical form of his equation seriously, and searching for a way of interpreting it, Dirac was led, in 1931, to propose that there should exist a class of 'anti-electrons,' particles with the same mass and spin as the electron but with the opposite electrical charge. By correctly predicting the existence of these antiparticles, now called positrons, Dirac became recognized as the 'discoverer' of antimatter - one of the most important discoveries of the century.*

Then ... in 1932, a professor at California Tech - Carl Anderson - proved Dirac's prediction about antimatter was accurate. While studying showers of cosmic particles in a cloud chamber, Anderson saw a track left by "something positively charged, and with the same mass as an electron."

After nearly a year of additional work, Anderson concluded that the tracks he saw were actually anti-electrons, "each produced alongside an electron from the impact of cosmic rays in the cloud chamber."

Anderson called the anti-electron a "positron," because of its positive charge. Because of his discovery, Anderson won the Nobel Prize in 1936. Anti-particles, as predicted by Dirac, were now a discovered reality.

Professor Dirac was a man of few words who preferred to work alone. According to his biographer, Graham Farmelo, he cried only once during his adult life - when he learned that Einstein had died.

From 1932 to 1969, Paul Dirac held the Lucasian Chair of Mathematics at Cambridge, the post which Isaac Newton had occupied earlier and Stephen Hawking held later. He was so intelligent that other famous scientists were astonished at his abilities. Freeman Dyson once said:

> *His discoveries were like exquisitely carved statues falling out of the sky, one after another. He seemed to be able to conjure laws of nature from pure thought.*

Credits:

Photo of Paul Dirac, taken in 1933, online courtesy University of Bristol.

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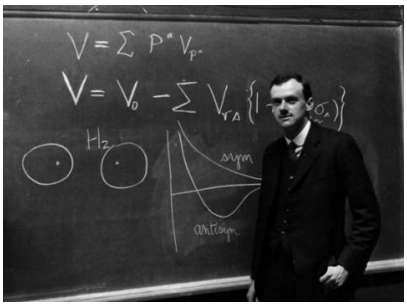

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