

# Clyde Lorrain Cowan Biography

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# Contents

[Clyde Lorrain Cowan Biography.....1](#)

[Contents.....2](#)

[Biography.....3](#)



# Biography

Clyde Lorrain Cowan was a physicist and educator who is best remembered for his work in uncovering the properties and proving the existence of neutrinos, a fundamental nuclear particle that is electrically neutral. After serving as a captain in the United States Army Air Forces in World War II, Cowan received his doctorate from Washington University in St. Louis in 1949. Cowan then went to work for the Los Alamos Scientific Laboratory in the **nuclear weapons** test division.

With no charge and negligible **mass**, the **neutrino** is extremely difficult to detect. In 1951, Cowan began a productive collaboration with American physicist **Frederick Reines** (1918-1998) at Los Alamos, initially focusing on detecting neutrinos emitted from a nuclear explosion. Cowan and Reines soon realized, however, that **nuclear reactors** could provide a large neutrino flux of  $10^3$  neutrinos per square centimeter per second. In 1953, they decided to use the Hanford nuclear reactor, moving operations to the Savannah River nuclear reactor in 1955, primarily for safety considerations. The two scientists' success in detecting the rare neutrino capture event in a nuclear reaction created the exciting field of experimental neutrino physics.

Cowan joined the faculty at the Catholic University of America in 1958 as professor of physics. His work included pioneering techniques of particle detection in elementary **particle physics**, monitoring of low-level **radioactivity**, and the medical uses of radioactive isotopes. He was a fellow of the American Physical Society and a Guggenheim fellow, and he served as a consultant to the United States Atomic Energy Commission and the Smithsonian Institution. In 1995, Cowan's partner, Reines, was awarded the Nobel Prize in Physics for their work. Because the award is not given posthumously, Cowan, who died in 1974, was not included.