

The ECE DEI Committee presents:
Asian American and Pacific Islander Heritage Month
Weekly Highlight
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Chen Ning Yang

Chinese American physicist, winner of Nobel Prize for Physics 1957



Chen Ning Yang is a Chinese American theoretical physicist whose research with Tsung-Dao Lee showed that parity—the symmetry between physical phenomena occurring in right-handed and left-handed coordinate systems—is violated when certain elementary particles decay. Until this discovery it had been assumed by physicists that parity symmetry was as universal a law as the conservation of energy or electric charge. This and other studies in particle physics earned Yang and Lee the Nobel Prize for Physics for 1957.

From 1965, Yang was Albert Einstein professor at the Institute of Science, State University of New York at Stony Brook, Long Island. During the 1970s, he was a member of the board of Rockefeller University and the American Association for the Advancement of Science and, from 1978, of the Salk Institute for Biological Studies, San Diego. He received the Einstein Award in 1957 and the Rumford Prize in 1980; in 1986 he received the Liberty Award and the National Medal of Science. Professor Yang has been elected Fellow of the American Physical Society and the Academia Sinica.

Chen Ning Yang was born on September 22, 1922, in Hefei, Anhui, China, the first of five children of Ke Chuan Yang and Meng Hwa Loh Yang. He was brought up in the peaceful and academically inclined atmosphere of the campus of Tsinghua University, Beijing, China. He received his college education at the National Southwest Associated University in Kunming, China, and completed his B.Sc. degree there in 1942. His M.Sc. degree was received in 1944 from Tsinghua University, which had moved to Kunming during the Sino-Japanese War (1937-1945). He went to the U.S.A. at the end of the war on a Tsinghua University Fellowship, and entered the University of Chicago in January 1946. At Chicago he came under the strong influence of Professor E. Fermi. After receiving his Ph.D. degree in 1948, Yang served for a year at the University of Chicago as an Instructor. He has been associated with the Institute for Advanced Study, Princeton, New Jersey, U.S.A., since 1949, where he became a Professor in 1955. He became a U.S. citizen in 1964.

Nobel Prize Work

Almost from his earliest days as a physicist, Yang had made significant contributions to the theory of the weak interactions—the forces long thought to cause elementary particles to disintegrate. (The strong forces that hold nuclei together and the electromagnetic forces that are responsible for chemical reactions are parity-conserving. Since these are the dominant forces in most physical processes, parity conservation appeared to be a valid physical law, and few physicists before 1955 questioned it.) By 1953 it was recognized that there was a fundamental paradox in this field since one of the newly discovered mesons—the so-called K meson—seemed to exhibit decay modes into configurations of differing parity. Since it was believed that parity had to be conserved, this led to a severe paradox.

After exploring every conceivable alternative, Lee and Yang were forced to examine the experimental foundations of parity conservation itself. They discovered, in early 1956, that, contrary to what had been assumed, there was no experimental evidence against parity nonconservation in the weak interactions. The experiments that had been done, it turned out, simply had no bearing on the question. They suggested a set of experiments that would settle the matter, and, when these were carried out by several groups over the next year, large parity-violating effects were discovered. In addition, the experiments also showed that the symmetry between particle and antiparticle, known as charge conjugation symmetry, is also broken by the weak decays.

References:

[C. N. Yang: Stony Brook Masters Series- YouTube](#)

https://en.wikipedia.org/wiki/Yang_Chen-Ning

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