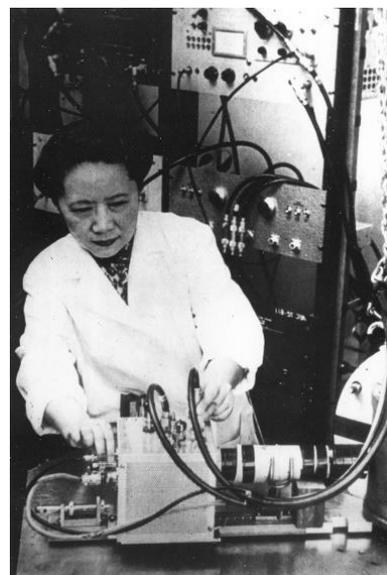


## Nobel Prize Case Study: Chien-Shiung Wu

Chien-Shiung Wu was a leading 20<sup>th</sup>-century Chinese-American nuclear experimental physicist who made extraordinary contributions to the field. She earned her undergraduate physics degree from National Central University in Nanjing and then her PhD in physics at the University of California, Berkeley. She then joined Columbia University in 1944 to work on enriching uranium ore for the Manhattan Project.

After working on the Manhattan Project during the Second World War, she focused on experiments to measure *beta decay*, a form of radioactivity in which a proton turns into a neutron (and vice versa) by emitting a *beta particle*—an electron or positron. While observing the emission of cobalt-60, she observed that the particles had a *preferred direction* of emission, which violated the *principle of parity*. This principle states that for any particle interaction, one cannot distinguish right from left or clockwise from counterclockwise.<sup>1</sup> Wu was the first to prove this phenomenon experimentally, along with her collaborators, the Low Temperature Group of the US National Bureau of Standards.

Wu's experimental discovery in 1957 confirmed a theory by Chen Ning Yang and Tsung-Dao Lee, who were then awarded the Nobel Prize in physics later that year, even mentioning Wu in their acceptance speech. The Nobel Prize committee states that Yang and Lee were named laureates "for their penetrating investigation of the so-called parity laws which has led to important discoveries regarding the elementary particles."<sup>2</sup> Although she designed and undertook the experiment that confirmed the theory for which the Nobel was awarded, Wu was not included in the prize. In 1978, she was awarded the inaugural Wolf Prize in physics, which is often considered the most prestigious award in each scientific discipline after the Nobel Prize, for her experimental contributions to this discovery.



Chien-Shiung Wu

### Discussion Questions

- (1) How many times was Chien-Shiung Wu nominated for the Nobel Prize in physics? \_\_\_\_\_
- (2) Summarize two arguments for why Chien-Shiung Wu should have been included in the Nobel Prize.
- (3) Summarize one argument that could explain why Chien-Shiung Wu was not included in the Nobel Prize.
- (4) Despite her exclusion from the Nobel Prize, do you think being awarded the inaugural Wolf Prize in 1978 sufficiently acknowledges her contributions to physics? Why or why not?

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<sup>1</sup> "Chien-Shiung Wu." *Physics Today*, May 31, 2016.

<sup>2</sup> "The Nobel Prize in Physics 1957." The Nobel Prize website.