Scientific Contributions

Dr. Chien-Shiung Wu (1912-1997) is most well known for designing an experiment to prove non-conservation of parity in beta decay. She cooled Co^{60} in a demagnetization cryostat and polarized the Co^{60} with cerium magnesium nitrate. A photomultiplier was placed behind a thin anthracene crystal to detect beta particles. From the beta decay of the Co^{60}, she discovered asymmetry in the angular distribution between the parent nuclei and the momentum of the electrons, proving that the "law of conservation of parity" can be violated under weak nuclear interactions.[1]

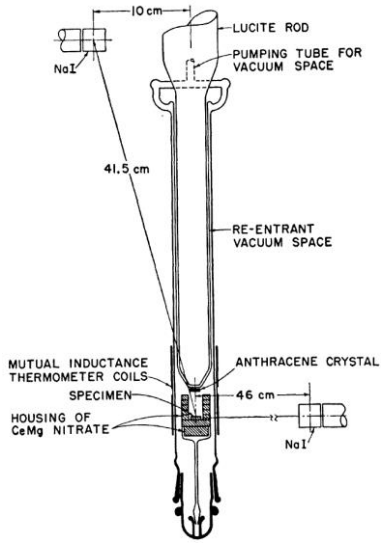

Figure 1: Lower part of cryostat[1]

Life and Upbringing

Dr. Wu went to the girl's elementary school, Ming De school, located in her hometown of Liuhe, Taicang. The school was founded by her engineer Father, who was a strong believer in gender equality. After graduating from the Suzhou Women's Normal School at the top of her class at 17 years old, she got admitted to Nanjing University for mathematics, but later decided to study physics. While at Nanjing University, she was chosen as a protest leader to urge the government to declare war on Japan for their invasion of Manchuria in 1931. One of her sit-in protests at the Presidential Palace was attended by President Chiang Kai-Shek. Despite originally planning to earn her PhD at the University of Michigan, she ended up going to UC Berkeley after learning women at the University of Michigan were banned from using the front entrance of a new student center. After receiving her PhD from Berkeley, she worked at the Manhattan Project's Substitute Alloy Materials Laboratory at Columbia University for three years. She stayed at Columbia University once the Second World War concluded, and in 1952, became the first female tenured physics professor in history.[2]

An Interview From the Future

Q: Dr. Wu, you were initially educated at your Father's elementary school. How did he influence you to become a scientist?

A: I grew up watching my Father persistently work towards modernizing and improving our village. I remember his appreciation of traditional Chinese culture even while focused on modern subjects. He would read me scientific articles in the newspaper and also taught Chinese classics like the *Analects of Confucius*. Despite the restrictions I felt as a women, I wanted to grow up to accomplish just as much as my Father. I wanted to work towards improving everyone's life the way he did ours.[2]

Q: Dr. Lee and Dr. Yang predicted parity would not hold true for weak nuclear interactions. You proved it, but only they received a Nobel prize in 1957. Do you think that decision was purely rational, or were you disparaged based on gender?

A: Dr. Lee and Dr. Yang had already been working on their investigation of the law of conservation of parity for a couple of years before I became involved. They had theoretical findings which indicated parity violation and a rough schematic of the experimental setup. There were several reasons for why I was denied, the main one resulting from the date of our results publication. My group's results were published in February 1957, which passed the deadline for the 1957 Nobel prize. There were also competing research groups who experimentally measured parity violation around the same time as my group. For these reasons, I don't believe I was snubbed due to my gender. "Although I did not do research just for the prize, it still hurts me a lot that my work was overlooked for certain reasons."[2]

References

(1) Wu, C. S.; Ambler, E.; Hayward, R. W.; Hoppes, D. D.; Hudson, R. P. *Phys. Rev.* **105** *1413* (1957).

(2) Chiang, T. C.; Wong, T. F. *Madame Wu Chien-Shiung: The First Lady of Physics Research*; World Scientific Pub Co Inc, 2014.