

Engineering Physics
University of Wisconsin
September 23, 1997

To: Michael Alley
From: Cindy Reese *CTR*
Subject: Request to Research How Credit Was Awarded for the Discovery of Nuclear Fission

For my EPD 397 project, please grant me permission to study the way in which credit has been awarded for the discovery of nuclear fission. Although Otto Hahn received the 1946 Nobel Prize in Chemistry for the discovery, several people assert that Lise Meitner and Fritz Strassman should have also received credit. In my research, I will attempt to discern how credit should have been bestowed.

This topic meets the criteria for a successful topic in this course. First, I am interested in the topic. As a nuclear engineering student, I realize that the discovery of nuclear fission was perhaps the single most important discovery this century in my field. As a woman scientist, I am also deeply interested in the successes and challenges faced by other women scientists. A second way in which this topic meets the criteria is that it can be quickly researched. A computer search in the library has revealed many sources available on this topic. Attached to this memo is a summary of one such source, *Lise Meitner: A Life in Physics* by Ruth Sime.

This topic also meets the third criterion for a successful topic in this course, namely, that it be technical. The nuclear fission of uranium involves an understanding of both chemistry and physics principles. By focusing on this single discovery, I believe that I can achieve the fourth criterion for a successful topic: the achievement of depth. Finally, because the library system at the University of Wisconsin offers such a wide array of possible sources, including papers in German, and because many of these sources have been written for audiences more technical than my intended audience, I believe that I can create a project that is unique.

If you have any suggestions for modifying this topic, please let me know. With your permission, I will continue researching.

Attachment.

Summary of Ruth Sime's *Lise Meitner: A Life in Physics**

In *Lise Meitner: A Life in Physics*, Ruth Sime begins following the life of the physicist Lise Meitner from her birth in Vienna in 1878. Meitner's career spanned the golden age of physics. She studied under Ludwig Boltzmann in Vienna, worked under Max Planck in Berlin, and was helped by Niels Bohr to find asylum during the Second World War. In her life, she met, corresponded, and worked with many other famous scientists: Albert Einstein, Werner Heisenberg, Marie Curie, Otto Hahn, and James Chadwick.

Her collaboration with Otto Hahn led to her greatest achievement, the explanation for the fission of uranium--an achievement for which, according to the author Sime, Meitner did not receive due credit. Meitner's collaboration with Hahn began in 1907 at the Friedrich-Wilhelm-Universitaet in Berlin. Although Hahn was a chemist, he was interested in radioactivity, a subject that also interested Meitner. Hahn readily accepted working with a woman. However, most of the scientists at the Universitaet did not, and at the Universitaet, Meitner endured ostracism. Nonetheless, Meitner and Hahn did such good work that both were promoted to professors and awarded institutes.

During the First World War, Meitner worked as a nurse on the eastern front, while Hahn helped develop chemical weapons. After the war, the two resumed their collaboration, despite the crippling inflation and weak economic situation that plagued Germany. When the Nazi party came to power in the 1930s, Meitner encountered difficulties because of her Jewish heritage. Although Meitner had long since switched to the Protestant faith, she was still considered a Jew by the Nazi party. In 1938, things became so dangerous for her that she fled Germany and finally found a position at an institute in Sweden. There, although her personal safety was secure, she had a contentious working relationship with the Institute's professor, Manne Siegbahn.

At the time that Meitner was leaving Germany, she and Hahn were researching the radioactive decay of uranium. During this time, they communicated often, mostly through letters. Hahn performed experiments with another chemist Fritz Strassman, while Meitner collaborated on the theoretical aspects with her nephew, Otto Frisch. In the overall collaboration, Meitner's influence was strong. According to Strassman, "she urgently requested that [the] experiments be scrutinized very carefully and intensively one more time...Fortunately, L. Meitner's opinion and judgment carried so much weight that the necessary control experiments were immediately undertaken." According to the author, these experiments "led directly to the discovery of nuclear fission."

In 1946, Hahn received the Nobel Prize for the discovery of nuclear fission. Neither Meitner nor Strassman shared in the award, though. Many scientists at the time considered "[Meitner's] exclusion as neither omission nor oversight but deliberate personal rejection, the work of Manne Siegbahn," who was on the Nobel award committee. Although Meitner visited Germany and Austria several times after the war, she could not bring herself to work there again. She continued studying, reading, and thinking about physics up until her death during the Fall of 1968 in Cambridge, England.

*Sime, Ruth, *Lise Meitner: A Life in Physics* (Berkeley: University of California Press, 1996).