

WHO'S WHO IN THE MANHATTAN PROJECT



LESLIE R. GROVES

An officer in the United States Army Corps of Engineers, Lieutenant General Leslie R. Groves headed a number of large-scale projects, including the construction of the Pentagon in Washington, D.C. Groves developed a reputation for intense organization and a relentless drive, which made him well suited to head the massive undertaking of the Manhattan Project. After receiving his orders in 1942, Groves took immediate action to organize and delegate the necessary tasks required to achieve the monumental feat of constructing an atomic bomb. By designating the three primary sites to develop specific aspects of manufacturing the materials for the atomic bomb and by working closely with leading scientists such as J. Robert Oppenheimer, Groves helped guide the successful completion of the Manhattan project within three years.

(Image: Los Alamos National Laboratory.)



ROBERT OPPENHEIMER

A theoretical physicist and professor of physics at the University of California, Berkeley, J. Robert Oppenheimer took a leading role in the Manhattan Project, specifically overseeing the construction of the atomic bombs. Before meeting Groves and taking charge of "Project Y," the site at Los Alamos, Oppenheimer was already working with leading scientists exploring theories of a potential atomic bomb. Oppenheimer came to head the manufacture of the world's first nuclear weapons at Los Alamos, a site he selected. Through his leadership, the Manhattan Project came to produce three atomic bombs. His significant role and scientific insight gained Oppenheimer the credit for being the "father of the atomic bomb."

(Image: Los Alamos National Laboratory.)



ENRICO FERMI

Enrico Fermi, an Italian physicist and recipient of the Nobel Prize in Physics, helped create the world's first nuclear reactor. Fermi led the successful experiment at the University of Chicago, called Chicago Pile-1, which resulted in the first ever self-sustaining nuclear **chain reaction**. The success of Fermi's experiment provided scientists working on the Manhattan Project with a model for the large-scale production of **plutonium**. For this reason, Fermi received recognition for being the "architect of the atomic bomb," and he remained actively involved in the construction of atomic bombs throughout the course of the Manhattan Project. Fermi was on hand when the reactor at Oak Ridge went **critical**, and he was in Hanford to insert the first **uranium** fuel slug into the B Reactor. Fermi was also present at the Trinity Test where he speculated whether or not the bomb would ignite the atmosphere. Following World War II, Fermi remained at the University of Chicago as a Distinguished Professor of Physics.

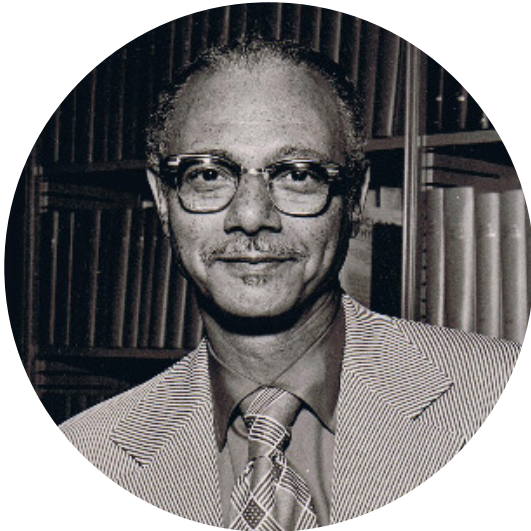
(Image: National Archives and Records Administration, 558578.)



CHIEN-SHIUNG WU (COLUMBIA)

Chinese American physicist, Chien-Shiung Wu is among the few individuals (and possibly the only individual) of Chinese descent to have worked on the Manhattan Project. Born near Shanghai, Wu studied physics at university in Shanghai and then migrated to California to complete her PhD at the University of California, Berkeley, in 1940. She became a physics instructor at Princeton University before joining the Manhattan Project in 1944. Working with a team of scientists at Columbia University, Wu specialized in the study of radiation detectors. Wu also identified the xenon poisoning that occurred in the B Reactor at Hanford, which temporarily shut down **plutonium** production. After World War II, Wu remained in the United States as travel to China became increasingly difficult with the outbreak of war between Chinese Nationalist and Communist forces. She remained at Columbia University for the remainder of her career.

(Image: Smithsonian Institution Archives, SIA Acc. 90-105.)



EDWIN R. RUSSELL
(CHICAGO/OAK RIDGE)

African American chemist Edwin R. Russell participated in the Manhattan Project by first working at the University of Chicago's Metallurgical Laboratory and later moving to Oak Ridge. Russell attended the University of Chicago to pursue a PhD in surface chemistry, and while there he became involved in the Manhattan Project. Russell researched the best methods for isolating and extracting **plutonium-239** from **uranium**. In developing techniques for purifying **uranium** ore, Russell's research helped expedite the production of **plutonium**. Following World War II, Russell returned to his home in Columbia, South Carolina, where he served as Chairman of the Division of Science at Allen University. He also earned 11 patents through his research on atomic energy processes.

(Image: Atomic Heritage Foundation.)



ELIZABETH RIDDLE GRAVES
(LOS ALAMOS)

Known as "Diz," Elizabeth Riddle Graves was an American physicist who received her PhD in physics from the University of Chicago where she conducted experiments on the detection and measurement of fast neutrons. She also worked with Fermi on the study of nuclear **chain reactions**, and her research helped contribute to the Chicago Pile-1 experiment. In 1943, after moving to Los Alamos to join the Manhattan Project, Graves selected the neutron reflector used to surround the bomb's core and became one of the top-ranking female scientists to work on the construction of atomic bombs at Los Alamos. She attended the Trinity Test while seven months pregnant and even completed a series of experiments while in labor. After World War II, "Diz" Graves continued to research nuclear physics at Los Alamos.

(Image: US Army.)



VERONICA TAYLOR
(NEZ PERCE/DISPLACED-HANFORD)

A member of the Nez Perce tribe, Veronica Taylor grew up near the location that became Hanford, off the Columbia River in Washington. When she was still a child, US military personnel began arriving in the area, preparing the site for the construction of Manhattan Project facilities. The construction of Hanford pushed Taylor and her tribe from the area on the Columbia River, which they relied on for a source of food. Moving to a new location disrupted many tribal practices. As tribal members continued to use the river for sustenance, Taylor bore witness to the rising cases of cancer that began to affect her community. Taylor herself battled breast cancer as a young woman. The sharp rise in cases of cancer caused many neighboring tribes to become wary of visiting the Nez Perce. Taylor would go on to speak out publicly about the effects of the Manhattan Project on her community. She also participated in restoration efforts, but fear of the land still keeps many tribal members from the area.

(Image: Atomic Heritage Foundation.)



KLAUS FUCHS
(SPY/LOS ALAMOS)

A German theoretical physicist, Klaus Fuchs became one of the most infamous spies to work on the Manhattan Project, secretly passing on information about the atomic bomb to the Soviet Union (USSR). Fuchs, who had fled Nazi Germany in 1933, went to England where he received a PhD in physics and another in science. Fuchs became a British citizen in 1942, and the following year he traveled with a team of British scientists to Columbia University in New York to work on the Manhattan Project. In New York, an agent nicknamed "Raymond" for the KGB—the main security agency for the Soviet Union—approached Fuchs and recruited him to spy on behalf of the Soviet Union. In 1944, Fuchs transferred to Los Alamos where he worked on imploding a **fissionable plutonium** core. He was also present at the Trinity Test. The entire time he was at Los Alamos, Fuchs passed on intelligence to Soviet agents. Awareness of Fuchs's espionage did not come to light until 1949. He initially denied the charges but ultimately confessed in 1950. After trial proceedings that lasted a total of 90 minutes, Fuchs received a sentence of 14 years in prison and lost his British citizenship.

(Image: National Archives UK.)