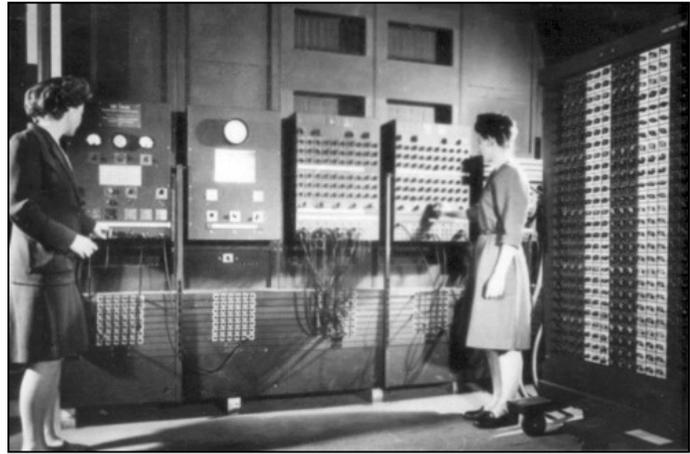


HIDDEN GEMS AND FORGOTTEN PEOPLE



KATHLEEN ANTONELLI (1921-2006) | PIONEER COMPUTER PROGRAMMER

Kathleen "Kay" Antonelli was an Irish-American computer programmer and one of the six original programmers of the [ENIAC](#) (the first general-purpose electronic digital computer).

Kay was born Kathleen Rita McNulty in the small village of Creeslough County Donegal on February 12, 1921 during the Irish War of Independence. On the night of her birth, her father, James McNulty, who was an Irish Republican Army training officer, was arrested and imprisoned in Derry prison for two years. On his release, the family immigrated, to the United States in October 1924 and settled in the Chestnut Hill, Philadelphia, Pennsylvania.

Kay attended primary school in Chestnut Hill and Hallahan Catholic Girls High School in Philadelphia. In high school, she studied algebra, geometry, algebra, trigonometry and solid geometry. After graduating high school, she enrolled in Chestnut Hill College for Women. During her studies, she took every mathematics course offered, including spherical trigonometry, differential calculus, projective geometry, partial differential equations, and statistics. She graduated with a degree in mathematics in June 1942, one of only a few mathematics majors out of a class of 92 women.

She also studied accounting, money and banking, business law, economics, and statistics.

After graduating, Kay was employed by the US Civil Service as a human computer to calculate bullet and missile trajectories at the Ballistic Research Laboratory. Each gun required its own firing table, which had about 1,800 trajectories. Computing a single trajectory required some 30 to 40 hours of handwork with a calculator. Her official civil service title, as printed on her employment documentation, was "computer."

After three months, Kay was moved to work on the differential analyzer. The analyzer could calculate a single trajectory computation (30 to 40 hours of work on a mechanical desk calculator), in about 50 minutes.

Between 1943 and 1946, the Electronic Numerical Integrator and Computer (ENIAC) was developed to perform these same ballistics calculation. In June 1945, Kay was selected as one of its first programmers. ENIAC could complete the same ballistics calculations described above in about 10 seconds. During her work programming the ENIAC, Kay was credited with the invention of the subroutine.

Kay married ENIAC co-inventor, John Mauchly, in 1948 after founding his own computer company with Presper Eckert. They had five children.

She worked on the software design of later computers including the BINAC and UNIVAC 1 computers whose hardware had been designed by her husband.

HIDDEN GEMS AND FORGOTTEN PEOPLE

John Mauchly died in 1980, and in 1985 Kay married photographer Severo Antonelli. After a long struggle with Parkinson's disease, Antonelli died in 1996.

Following Mauchly's death, Kay carried on the legacy of the ENIAC pioneers by authoring articles, giving talks and making herself available for interviews with reporters and researchers. She was inducted into the *Women in Technology International Hall of Fame* in 1997 together with the other original ENIAC programmers, and she accepted the induction of John Mauchly into the *National Inventors Hall of Fame* in Akron, Ohio in 2002.

Kay Antonelli died from cancer in Wyndmoor, Pennsylvania on April 20, 2006, aged 85.

During the hey-day of ENIAC, notoriety escaped Kay and her fellow 'computers'. The invisibility of "*The Refrigerator Ladies*" (both from being women and the secrecy of their work, especially during the war) kept them from the public eye. Now, many years later, their contributions are just starting to be justly recognized. In 2010, a documentary called, "*Top Secret Rosies: The Female 'Computers' of WWII*" was released.

Peter Mooney