

## **John von Neumann, “Father” of the Computer** **Hungarian Mathematician. Born: Dec 28, 1903, Died: Feb 8, 1957)**

John von Neumann is considered one of the best, if not the best, mathematician of the 20<sup>th</sup> Century. His fields of study include set theory, functional analysis, quantum mechanics, ergodic theory, continuous geometry, economics and game theory, computer science, numerical analysis, hydrodynamics, and statistics. He was a principal member of the Manhattan Project and the Institute for Advanced Study in Princeton.

Von Neumann's father was a lawyer who worked in a bank. Born Newmann Janos Lajos, von Neumann was an early childhood prodigy showing aptitude in languages, memorization and mathematics. He received his Ph. D. in mathematics, with minors in experimental physics and chemistry, from Pazmany Peter University in Budapest at the age of 22. Simultaneously he earned his diploma in chemical engineering from the ETH Zurich. Between 1926 and 1930, he taught as a privatdizent at the University of Berlin, the youngest in its history. By 25 he had completed ten major papers, and by 30, nearly 36. After his father's death in 1930, von Neumann, his mother and his brothers emigrated to the United States. Here he joined Princeton University's Institute for Advanced Study. He stayed there until his death. Colleagues included Albert Einstein and Kurt Godel.

In 1937, von Neumann became a citizen of the US and in 1938 he was awarded the Bocher Memorial Prize for work in analysis. Von Neumann married twice, in 1930 to Mariette Kovesi (daughter, Marina), and Klari Dan. In 1955 von Neumann was diagnosed with either bone or pancreatic cancer. He died a year and a half later. Of his 150 published papers, 60 were in pure mathematics, 20 in physics and 60 in applied mathematics. His last work was titled *The Computer and the Brain*, which gives you an idea of where his interest were leading him.

His early work in Set Theory and Game Theory led him to develop the Monte Carlo method of computer simulations using pseudorandom numbers using the middle-square method. He was one of the early architects of the ENIAC computer. Von Neumann created the field of cellular automata using pencil and graph paper. He was credited with the invention, in 1945, of the merge sort algorithm.

For more information on von Neumann, please google him to read about this great 20<sup>th</sup> century mathematician.