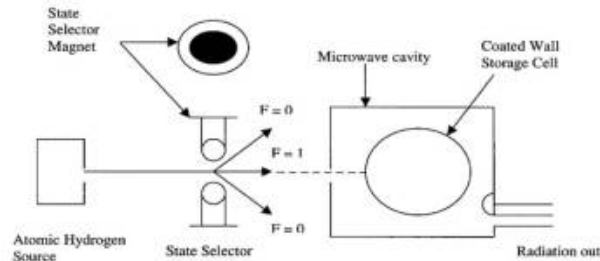




## Norman Ramsey: Nobel Prize in Physics 1989



Norman Ramsey



Norman Ramsey was born on August 27, 1915 in Washington, D.C. During his childhood, his family moved around due to his father's job duties as an army officer. He graduated from high school with distinctions at the age of 15. He entered Columbia College in 1931 and studied mathematics. After his graduation in 1935, he turned to physics and came to the [Cavendish Laboratory](#), Cambridge, where he studied for his second bachelor degree. He was inspired by great physicists such as [J.J. Thomson](#), [Rutherford](#), [Chadwick](#), [Cockcroft](#), Eddington, and [Appleton](#) from the Cavendish Laboratory and wished to become a great physicist and inventor. Later, he returned to Columbia for his PhD and worked for Isidor Rabi in molecular beam research. For the next few years, Ramsey worked in many places, including Illinois, MIT, Columbia and Brookhaven National Laboratory, before moving to [Harvard University](#) where he worked for 40 years.

At Harvard he established a molecular beam laboratory for his molecular beam magnetic resonance experiments. After many attempts, he invented the separated oscillatory field method that allowed him to achieve the desired accuracy. In order to get improvements, he consulted with various groups that applied his method to atomic clocks. He later built a separated oscillatory field electric resonance apparatus and used it to study polar molecules. With the help of a student, Daniel Kleppner, Ramsey invented the atomic hydrogen maser, which is useful equipment for atomic research and it is used in many research centres. Ramsey received the Nobel Prize in Physics 1989, "for the invention of the separated oscillatory fields method and its use in the hydrogen maser and other atomic clocks".

In 1940 he married Elinor Jameson. After Elinor died in 1983, he married Ellie Welch. He has a combined family of seven children and six grandchildren. Ramsey officially retired from Harvard in 1986, but he still remains active in physics. After his retirement, he was a visiting researcher at the University of Colorado and a visiting professor at the University of Chicago, Williams College and the University of Michigan. He now enjoys his life as a part-time teacher, researcher and visiting professor.