John Hasbrouck Van Vleck Biography

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Biography

Van Vleck was born in Middletown, Connecticut, on March 13, 1899. He received his bachelor's degree from the University of Wisconsin in 1920 and his master's (1921) and doctorate (1922) from Harvard University. After teaching for a year at Harvard, he accepted an appointment in the physics department at the University of Minnesota (1923-1927) and then at the University of Wisconsin (1928-1934). Van Vleck then returned to Harvard, where he remained until his retirement three decades later. He was also visiting professor at the University of Leiden in 1960 and at Oxford in 1961-1962. Van Vleck is best known for his research on the magnetic properties of atoms. In the 1920s and 1930s he wrote a series of papers that made use of modern quantum mechanical theory to explain the nature of paramagnetic and ferromagnetic materials. His work was so successful that he eventually became known as "the father of modern magnetism."

Van Vleck also contributed to our understanding of electron correlation. He showed that the energy state of the electrons in an atom or ion is modified by the presence of other atoms and ions in the vicinity. These modifications result in electrical, magnetic, and optical properties that are different from those of an isolated substance. For his contributions to our understanding of the electronic structure of magnetic materials, van Vleck received a share of the 1977 Nobel Prize in physics.

During World War II, van Vleck made some important contributions to the development of radar. He showed that water and oxygen molecules in the atmosphere absorb radar of wavelengths of 12.5 mm and 5 mm, problems that must be accounted for in the use of radar. He died in Cambridge, Massachusetts, on October 27, 1980.