

GENEALOGY DATABASE ENTRY

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Bloch, Felix

DATES:1905 - 1983

DEGREE: PhD

DATE: 1928

PLACE: Leipzig

TEACHER/RESEARCH ADVISOR: Heisenberg

Nobel Prize in physics in 1952 for the discovery of nuclear induction (i.e., NMR), which allowed the measurement of nuclear magnetic moments with very high precision; found the solution of the quantum theory of metals; worked on ferromagnetism and established the nature of the boundaries between domains (the two parts of a ferromagnetic crystal that are magnetized in different directions), which have subsequently been known as "Bloch walls"; contributed the Bethe-Bloch theory of the stopping of charged particles in matter; obtained experimental results on the magnetic scattering of neutrons, determining the magnetic moment of the neutron; studied neutron polarization by ferromagnetic media and the behavior of atoms in a time-varying magnetic field; discovered the Bloch-Floquet theorem specifying the form of wave functions for electrons in a crystal (functions which satisfy the conditions of the theorem are referred to as Bloch functions and used to investigate the structure of metals); provided a theoretical explanation for the temperature dependence of the electric conductivity of metals (the Bloch-Gruneisen relationship); discovered the Bloch theorem of superconductivity, which rules out some of the possible explanations of superconductivity by ascribing persistent electric currents to a state of minimum energy of the conduction electrons; discovered the Bloch $T^{3/2}$ law which describes the dependence on temperature of magnetization in a ferromagnetic material; discovered the Bloch-Nordsieck theory which showed that collisions of charged particles are necessarily accompanied by the emission of infinitely many light-quanta;

1. *Physics Today* **1984**, 37(3), 115-116.
2. *Nature* **1952**, 170, 911-912.
3. *Nature* **1954**, 174, 774-775.
4. *McGraw-Hill Modern Men of Science*; McGraw-Hill: 1966; vol. 1, p45-46.
5. *National Cyclopaedia of American Biography*; James T. White & Co.: 1921-1984; vol. I, p310-312.