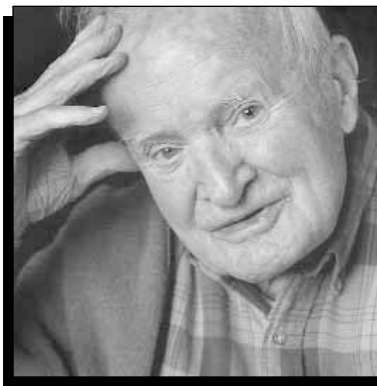


Arthur Robert von Hippel (1898–2003) — In Memoriam

Arthur Robert von Hippel, a luminary in the field of materials science as we know it today, passed away on December 31, 2003, at the age of 105. He is known to every MRS member through the Von Hippel Award, the most prestigious and oldest award of the Materials Research Society. It is especially appropriate that Professor von Hippel was not only selected as the first recipient of the award in 1977, but that the award bears his name, because of his enormous and visionary influence on how materials research has developed as an interdisciplinary research field, drawing on the many traditional disciplines which are needed nowadays for carrying out materials research at the cutting edge. Thus, von Hippel was cited not only for his pioneering contributions to the study of dielectrics, semiconductors, ferromagnets, and ferroelectrics, but also for his interdisciplinary approach to materials research, promoting the collaboration of scientists to solve fundamental materials problems from the atomic to the nanostructural to the microstructural levels. Furthermore, at each of the next seven Von Hippel Award ceremonies (1978–1984), Professor von Hippel took part in the festivities, often presenting a short address on personal reminiscences, frequently reflecting on international aspects of materials research, and sometimes also commenting directly on its interdisciplinary characteristics. Interestingly, as the years have passed, his approach to materials research has become the centerpiece of MRS and has guided the organization of symposia at its Spring and Fall Meetings.

Arthur von Hippel's roots were in Göttingen, Germany, where his father was a law professor, and where he completed his PhD thesis in 1924 at the Institute for Applied Electricity. He subsequently spent two years in Jena studying the sputtering of metals with Max Wien, and then a year at the University of California in Berkeley studying the ionization characteristics of mercury atoms by ionization impact, finally returning to Göttingen as a Privat-Dozent from 1929 to 1933, where he studied electrical breakdown in gases and in crystalline materials, a topic that he revisited later in his career. After his marriage to Dagmar Franck in 1930, who was Jewish, and compounded by his outspoken anti-Nazi position at the University and in the press, he and his growing family were effectively compelled to leave Nazi Germany. Fortunately, he was able to secure a professorship in Turkey in 1934, which was followed by an invitation to the Niels Bohr Institute in Copenhagen start-



Arthur R. von Hippel at age 100; photo taken by his grandson, photographer Jonas A. Kahn.

ing in 1935, where he remained until 1936, when he was invited by Karl Compton to join the Massachusetts Institute of Technology Electrical Engineering faculty. In 1939, von Hippel founded the Laboratory for Insulation Research at MIT, where he assembled a group of chemists, physicists, and engineers within the Electrical Engineering Department to synthesize, characterize, study, and model the physical properties of dielectric materials and to build devices stemming from this interdisciplinary research. Since support came largely from industrial sponsors, practical outcomes of the research were of particular relevance. With the coming of World War II and the involvement of the U.S. scientific community in wartime research, this interdisciplinary approach worked very well in developing dielectric materials for radar applications, including the development of measurement techniques and equipment to determine the temperature- and frequency-dependence of the dielectric properties of many materials, as part of the MIT Radiation Laboratory wartime program.

The success of the Laboratory for Insulation Research in problem-solving, in training a new type of interdisciplinary researcher, and in setting up shared research facilities, along with other efforts at other institutions during the wartime years, strengthened von Hippel's vision to promulgate this approach to materials research more widely. This vision strongly affected his postwar educational activities, as he developed an interdisciplinary approach to teaching materials research and to writing books. His publications covered both the research output of the Laboratory for Insulation Research, in the form of several books on the structure and properties of dielectrics, and his own

approach to teaching, culminating in a review article, "From Atoms Toward Living Systems" (*Materials Research Bulletin* 14 [1979], p. 273). It can be argued that this vision and its success in terms of problem-solving and educational impact led to the creation of the national program of federally sponsored Materials Research Laboratories, first by the Department of Defense (1960–1972), later by the National Science Foundation (1972–present), and subsequently adopted in other countries.

Although von Hippel was a hard driver to achieve research results, he found time for daily exercise, for art and music, and for friends from around the world. He also felt compelled to involve his students and colleagues in these broader aspects of life and culture. In fact, my first meeting with "the Professor," as he was fondly called, came through music rather than through materials research. Music played an important role in the social aspects of the Laboratory for Insulation Research, and two of his laboratory staff members, Joe Stein (his editor) and John Jelatis (a member of his engineering staff) were both accomplished musicians. On one occasion, they wanted to put on a lab performance and needed another player. In this way, I was invited to join the chamber music group and got to meet Professor von Hippel. We soon became close friends, and the friendship increased dramatically when I also became a member of the MIT Electrical Engineering Department in 1967. Then for more than a decade I arranged a musical event for his birthday on November 19.

Professor von Hippel greatly enjoyed the outdoors, and often invited members of the Laboratory to join him on weekend skiing trips. In his later years, he invited friends and former associates to join him on his daily vigorous walks in the woods, rain or shine. His devotion to the outdoors and exercise contributed to his own high energy level and to his long and active research career that stretched well into his eighties.

On the personal side, Professor von Hippel was highly devoted to his wife and partner Dagmar, and left a strong imprint on his daughter and four sons, all of whom went on to highly successful careers, with a large emphasis on concern for the world about them. But family to von Hippel also included his many students, former students, and laboratory associates. In this context, he showed great pleasure talking about materials research to members of this extended family over tea and cookies.

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