

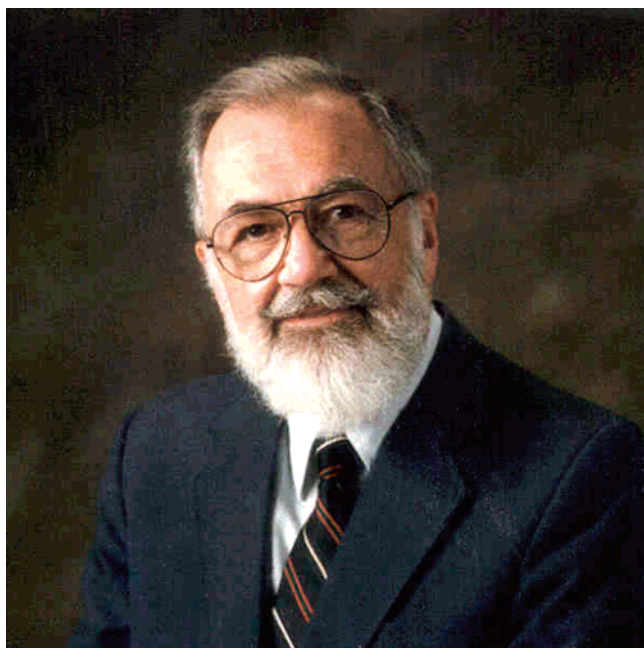
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H. Douglas Keith



H. Douglas Keith, a leading figure in polymer research for almost half a century, recently celebrated his 75th birthday. Keith was born in Belfast, Northern Ireland, on March 10, 1927. He obtained a B.Sc. degree from Queens University, Belfast, in 1948 and a Ph.D. in Physics from the University of Bristol, UK, in 1951. Doug studied under, and worked closely with, such luminaries as Peter Paul Ewald, Sir Neville Mott, and Sir Charles Frank.

Keith began his career as a Lecturer in Physics (specializing in optics) at the University of Bristol, where he taught between 1951 and 1956. The following year he emigrated to the United States and joined Elio Passaglia's group at the American Viscose Corp. in Marcus Hook, PA, which was then starting a research program on polymeric materials. It was there that Keith met Frank J. Padden, Jr., who became his lifelong collaborator. While at American Viscose, Keith and Padden did their first major work in polymer science, in which they analyzed both theoretically and experimentally the optical properties of spherulites.¹

In 1960, Keith and Padden moved to Bell Telephone Laboratories, where Keith had been asked to put

together a group to advance the nascent field of polymer morphology. Very soon thereafter they published a highly influential paper describing what is broadly known as the "Keith and Padden theory of spherulitic crystallization".² This phenomenological theory explained the crystallization and structure of polymeric spherulites based upon competition between their crystalline growth rate and diffusional processes in the melt and has been used very extensively in the study of polymer melt solidification.³ Subsequently, he and Padden provided a major morphological study of melt-crystallized isotactic polypropylene, a material of great industrial importance that was just coming to the fore.⁴ They did the same for isotactic polystyrene,⁵ polyesters,⁶ and other classes of polymeric materials, including a number of polypeptides⁷ (in which they were joined by B. Lotz and G. Giannoni, who were at that time visiting scientists in Keith's laboratory). As part of that work they also obtained the first chain-folded single crystals of DNA.⁸

Another seminal contribution made under Keith's leadership was the discovery of intercrystalline links between lamellae in polymeric spherulites,⁹ which provided the needed explanation for the mechanical strength of crystalline polymers. This discovery resulted from Keith's ingenious experimental design, which involved cocrystallization with low-molecular-weight hydrocarbons that could then be dissolved away, thus revealing the macromolecular connections between individual crystals. For their many important contributions to the field of polymer crystallization and morphology, Keith and Padden were honored with the High-Polymer Physics Prize of the American Physical Society in 1973.

At Bell Laboratories, Doug Keith was rapidly promoted to Head of the Analytical Chemistry Research Department and, later, Head of the Organic Materials Research Department. Doug was a superb mentor to many scientists who had come to work with him as postdoctoral researchers or who began their careers in his Department; among them are three of the coauthors (F.S.B., B.L., and A.J.L.).

In 1988, Doug Keith retired from AT&T Bell Laboratories and moved to the University of Connecticut. There he continued to tackle the thorny problem of lamellar twist and banding in polymeric spherulites.¹⁰ Characteristic of his enduring passion for science, Doug

has continued his creative work on polymer morphology even after becoming Professor Emeritus in 1996. His latest publication (currently in press) provides an interpretation for the generation of the remarkable giant screw dislocations in polymers.¹¹

Keith has been very active in the American Physical Society (APS), of which he is a Fellow. He chaired the Polymer Physics Division in 1965–1966 and later (1977–1985) was its representative (Divisional Councilor) at the APS Council; he has also chaired the Committee on Applications of Physics. Doug is a Fellow of the American Association for the Advancement of Science and was the 1986 Fraser Price Lecturer at the University of Massachusetts–Amherst. Over the years, he has served on the Editorial Advisory Boards of *Macromolecules* and the *Journal of Polymer Science*.

Doug Keith has been an inspiration to all who have worked or interacted with him. As one of the early pioneers in polymer morphology, he laid many of the foundations on which the field has been built. His research combines great insight with brilliant experimental design and analytical depth—and invariably invokes rigorous, fundamental science. His written and spoken English are always elegant, clear, and precise: his manuscripts are a pleasure to read for their cogency and style, and his lectures are exciting and memorable. To his younger colleagues, students, and postdocs, he provides an outstanding example of how science ought to be conducted and embodies the proverbial description of “a scholar and a gentleman”.

Socially, too, Doug has always been a pleasure to be around. A delightful raconteur with great wit, he draws on his many interests outside science (history, biography, music, literature) to captivate friends and colleagues alike. His lifelong passions include golf and singing; for many years he performed in a number of choral groups with his wife Gerhild. Doug is the proud parent (along with his first wife, Mollie) of Sheelagh (a nursing supervisor in Long Island, NY) and Brian (a biomedical researcher in Philadelphia, PA); he is also the beloved grandfather of eight.

Polymer science has been permanently enriched by Doug Keith's scientific contributions and leadership, as have we by his friendship. Sadly, we have recently learned that Doug is battling a serious illness, armed as ever with his characteristic strength, grace, and humor. Joined undoubtedly by the many others whose lives he has similarly enriched, we send our fondest thoughts and best wishes to Doug and his family.

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