

Robert A. Laudise – An obituary

Dr Robert (Bob) Laudise, an illustrious materials scientist at Lucent Technologies, Bell Labs, passed away in New Jersey on 20 August 1998, rather unexpectedly. He had a very productive scientific career at Bell Labs, spanning over four decades. He was a pioneer in crystal growth and materials research, and had a broad understanding of the subject, including applications to technology.

Robert Laudise was born in Amsterdam, New York on 2 September 1930. He received his B Sc degree in chemistry from Union College, Schenectady, New York in 1952, and a Ph D in inorganic chemistry from MIT in 1956. The same year he joined Bell Labs, and spent his entire career as a materials research scientist in Murray Hill, New Jersey. From a member of technical staff he rose to the position of a Director, assuming responsibilities for materials research at AT&T Bell Laboratories and later at Lucent Technologies Bell Laboratories, and in charge of both basic science and applications. His influence as a materials scientist extended beyond industrial research to government research – policy making, materials research in academia, and to scientific journals and Professional Societies.

Bob Laudise's initial accomplishments are primarily in the field of crystal growth of electronic materials. He was among the first to recognize their unique role in future technologies. He pioneered the hydrothermal crystal growth of quartz, and developed it from laboratory science to full-scale industrial production at the Western Electric, Merrimack Valley Plant. The work involved precise determination of the thermodynamic conditions (pressure and temperature) for optimal growth, and trouble-shooting of production for many years. This is an outstanding success story of the old Bell Labs era. Many of us, interested in quartz, have a large rectangular piece of the synthetic quartz crystal grown at Western Electric as a memento, obtained through a member of Laudise's team.

Laudise's work laid the foundation for commercial hydro-thermal growth of many other single crystals of technological importance. He was specially interested in hydro-thermal crystallization and in the preparation of piezoelectric, laser, nonlinear optic and related

materials. Groups which he led at Bell Labs made the first large single crystals of lithium niobate (NLO) and yttrium aluminum garnet (YAG) doped Nd-laser crystals. In those days, Bell Labs had the world's best crystal growth experts, each specializing in a particular type, or method of preparation. Several of them were in Laudise's lab. Bob Laudise nurtured optical fiber research at Bell Labs in the early days, and later his managerial persistence was critical in establishing the optical fiber technology for modern communication. In the last few years he was able to give some time to his long cherished interest, namely, the role of materials in solving environmental problems. He promoted the concepts of materials cycling, green materials and green processing (sometimes called industrial ecology) as important activities for materials scientists, through lectures, courses and publications.

In 1993, Bob stepped down from his formal managerial responsibilities (Directorship) and became Adjunct Chemical Director, with more time for research and advisory role in matters related to chemical research, electronic materials and quality concepts throughout Lucent Technologies. He was highly valued by the company, and in his new role he could stay with Bell Labs, -past the mandatory retirement for managers at the age of 65.

Laudise has authored 200 publications and holds 13 patents. His book *The Growth of Single Crystals*, published by Prentice Hall is a classic in the field. In large measure due to his efforts, the status of crystal growth has advanced from an art to science and to technological production. Bob was a driving force behind making crystal growth as a discipline, and for founding the crystal growth community. He was one of the founders of the International Organization for Crystal Growth and served two terms as its President. He was the founder of the American Association for Crystal Growth, and was instrumental in founding the Materials Research Society.

Laudise received numerous scientific awards and honours: A. D. Little Fellowship (MIT), Sawyer Prize-1974, the International Crystal Growth Prize-1981, the American Chemical Society Materials Chemistry Prize-1990, Orton Award of the American Ceramic Society-1994,

Union College 200th anniversary medal-1995, Application to Practice Award, TMS-1996. He was elected a Fellow of the National Academy of Engineering in 1980 and the National Academy of Sciences in 1991. The International Organization for Crystal Growth named its experimental prize the 'Laudise Prize', in 1989 – Bob was elected a member or fellow of numerous Scientific Bodies devoted to materials science, and a fellow of the American Academy of Arts and Sciences in 1998, a signal recognition as an outstanding scientist. Bob has served in numerous government committees and has edited the *Journal of Crystal Growth* (1980-1984) and the *Journal of Materials Research* (1994-1998). He has served in an advisory capacity at a number of academic institutions.

Bob Laudise was a dedicated scientist, with concern for his coworkers and their aspirations. He demanded the best from his team, but was very supportive of them. He set the management style for carrying out interdisciplinary materials research at Bell Labs. Laudise strongly believed in serving the needs of the Company, while at the same time advancing the frontiers of science. During his career he successfully managed this goal, for in his mind this was synergistic and mutually beneficial. His vision and leadership were truly remarkable, and undoubtedly, he was one of the world's foremost materials scientists, whose interest spanned the entire spectrum from basic science to application and technology.

He was a happy family man, with five children. Laudises are well remembered by his colleagues for their friendliness and hospitality. Bob Laudise will be very much missed by his colleagues, friends and by the Crystal Growth Community in particular.

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