

J.M.D. COEY & G.A. SAWATZKY

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**Allan H. Morrish**  
**1921-2010**



Allan Morrish, a pioneer of magnetism in Canada, died in hospital in Winnipeg on 27th August 2010 at the age of 89. A native of Winnipeg, and a strong advocate for Canada's central city, Allan was born to Agnes and Stanley Morrish on 21<sup>st</sup> April 1921. He grew up during the depression and he completed his B.Sc. in 1943 at the University of Manitoba, with the help of numerous scholarships. After serving briefly in all three branches of the Canadian Armed Forces, Morrish obtained an MA in mathematics at the University of Toronto in 1946, and went on to complete a PhD in nuclear physics at the University of Chicago three years later for a thesis on 'The (p, $\alpha$ ) Resonance in  $^{19}\text{F}$ '. His contacts there with some of the most distinguished physicists of the age – Fermi, Allen, Yang, Lee – set the foundations for his future dedication to the subject. A series of short-term appointments included a spell at UBC from 1949-1952 and a year as National Research Council fellow in Bristol where he worked on cosmic rays in Powell's group around the time of the discovery of the  $\mu$  meson. It was at UBC that Allan was introduced to solid state physics by A. J. Dekker, the author of an early textbook on the field, who remained a close friend throughout his career.

A move to the University of Minnesota in 1953, led to his appointment as Professor in the Department of Electrical Engineering. His 11 years in Minnesota were a productive period when he developed his interests in magnetism, stimulated by contacts with W. F. Brown. They proved the Brown-Morrish theorem relating the magnetostatic energy of any uniformly-magnetized sample to that of an ellipsoid of the same volume, and it was in Minneapolis that Morrish carried out his elegant experimental demonstration of a square hysteresis loop in a tiny single-domain ferrite particle. It was also there that he wrote *The Physical Principles of Magnetism*, a comprehensive and influential account of magnetism in solids, which was for long used as a graduate text, and was translated into several languages. Writing 30 years after the 1930 Solvay Conference where the modern understanding of the subject, with its roots in quantum mechanics and relativity was formulated, Morrish provided a coherent account of magnetism based on the localized-electron picture, with extensive reference to the original literature. Micromagnetism, the molecular field theory of ferromagnetism, antiferromagnetism and ferrimagnetism and magnetic resonance were the principal topics. His approach to the subject owed much to Néel, and his book brought the French empirical approach to magnetism to a North American audience.

Morrish moved back to the University of Manitoba in 1964, where his broad experience made him the perfect choice as first head of the amalgamated Departments of Physics and Mathematical Physics, a position he relished and occupied for the next 21 years. Together with Clarke Searle, he set up an active group in magnetism, and in a period of expansion he was able to recruit a number of colleagues specialized in different aspects of the field, which became a strength of the Department. His own research was focused on oxides, with facilities for crystal growth, measurement of static magnetic properties and Mössbauer spectroscopy, which he introduced to Canada with the help of Falkert van der Woude, a postdoc from Dekker's group in Groningen in the Netherlands. His research on spinel ferrites, manganites, hematite and chalcogenides attracted considerable support from the funding agencies; the work on crystals of the mixed-valence manganites published in a series of five papers in the Canadian Journal of Physics marked the second wave of research on these materials, which had been discovered as ceramics in the Netherlands 25 years previously, and which were to be rediscovered as colossal magnetoresistance materials 20 years later and subsequently used in thin film applications. His studies of hematite, and the Morin transition were summarized in a short monograph *Canted*

*Antiferromagnetism: Hematite.* He published the first Canadian report of a high- $T_c$  oxide superconductor in 1987.

Elected a fellow of The Royal Society of Canada in 1969, Morrish and was awarded the Medal of the Canadian Association of Physicists for Achievement in Physics in 1977. He served as president of the Association from 1974-5. He was also a fellow of The Institute of Physics and The American Physical Society. His papers, which have been cited more than 5000 times, continue to attract a steady stream of citations; he remained active well into his 80s, publishing his last paper in 2005.

Morrish was an inveterate traveler, spending periods as visiting professor in Australia, Japan and California, as well as a year in Oxford as a Guggenheim fellow in 1957-9. He attracted a steady stream of visitors to Winnipeg from all over the world, as well as some outstanding students. 'Big Al' had an appetite for life, and enjoyed running his Department. Retirement was no easy transition. He retained his curiosity and his mind remained acute as his horizons narrowed towards the end of his life. Alan Morrish will be remembered for his achievements in Winnipeg, and for the vision which he managed to realize there. Allan Morrish is survived by his former wife Hilda, his sons John and Allan, and his sister Gladys.

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