William Douglas Allen, an innovative physicist and engineer, was an outstanding figure in the British development of large electrostatic accelerators. He died on 7 May.

Allen, who was always known as Doug, was born in Mussoorie, India, on 27 July 1914 and spent his early life as part of a South Australian Methodist mission based at Azamgarh near Varanasi. When he returned with his parents to Adelaide he attended Prince Alfred's College and, subsequently, Adelaide University. A man of many talents, he also studied piano at the Elder Conservatorium and played hockey for Australia against India in Melbourne in 1935.

Awarded a Rhodes Scholarship for South Australia in 1937, Doug was a member of New College, Oxford, and was awarded a D. Phil in nuclear physics from the Clarendon Laboratory in 1940. He married Genevieve Thomson, also from Adelaide, in November 1939 in St James' Church, Muswell Hill, London. During the Second World War he worked initially with the pioneering radar establishment at Swanage, and then at TRE Malvern, before moving to Berkeley, California, to work on uranium-isotope separation.

After a brief return to Australia he was invited back to the UK in 1946 to join the nuclear physics division at AERE, Harwell. Together with the unrelated K W Allen, he led the team that designed and built tandem van de Graaff accelerators at Aldermaston and Harwell. The Harwell machine began operating only months after the world's first tandem, built by van de Graaff's company for the Canadian Chalk River Laboratory, and it remained a valuable resource for more than 40 years.

In 1961 Doug transferred with the Accelerator Division to the new Rutherford Laboratory near Harwell to lead the group charged with designing and installing the coupled electrostatic accelerators for the new nuclear physics laboratory in Oxford. His patent for improved accelerator tubes was the basis for tubes used in van de Graaff generators in five continents. He also invented the laddertron, a charging system for electrostatic machines adopted, among others, by the designers of the large national tandem at the Daresbury Laboratory in the UK.

Doug remained at the Rutherford Laboratory until 1977, simultaneously holding a visiting professorship in the Engineering Department at Reading University. He was also a visiting professor at the University of the West Indies (1978–1979) and at Southampton University (1978–1981), where he received an honorary D. Sc in 1984.

His wife, Genevieve, predeceased him by three months. He is survived by four children and by 13 grandchildren and great-grandchildren.

James Allen and Richard Hyder.