



KEITH V. ROBERTS

1925-1985

In Memoriam

Keith V. Roberts

Keith V. Roberts, a pioneer in computational physics, died on September 19, 1985, at his home in Oxford. He waged a heroic year-long bout with cancer while he was writing a book on his ideas on economic theory, which were influenced by his training and experience in physics and computing.

Keith was born on June 7, in London, England and educated at Christ's Hospital and Kings College, Cambridge. He received his degree in physics from Cambridge at the age of 20. World War II was not over, and he was directed to work at the Liverpool cyclotron with Sir James Chadwick on nuclear physics for the Allied atomic weapons program. The end of the war allowed Keith to return to Cambridge to work on his Ph.D. in quantum field theory.

Keith moved to Bristol University for research in quantum field theory. During this time he married Ann, who became his constant companion and mother of their three children, Patricia, Naomi, and Richard. Keith was awarded a Commonwealth Fellowship at the Institute for Advanced Study, Princeton, New Jersey, and in 1952 returned to Kings College, Cambridge, as a Research Fellow.

At the age of 30, Keith made a definite change of career and joined AWRE Aldermaston in 1955. There he developed several fundamental concepts and became Superintendent of Thermonuclear Physics.

In 1959 Keith embarked on research into controlled nuclear fusion, initially at AERE Harwell and from 1962 at the newly created UKAEA Culham Laboratory, where he was to spend the rest of his career. He was closely involved with the first director, J. B. Adams (later Sir John Adams, CMG, FRS), in setting up the new laboratory and was influential in determining its initial research program. He became head of an experimental division and later Head of the Theoretical Physics Division.

Keith's outstanding success at AWRE was achieved as a member of a small research team. On the other hand, it was during this time that he grew to appreciate the value of large-scale computing, which had been introduced to great effect at Aldermaston. He therefore set out to create comparable resources and expertise in computational physics for research in controlled fusion. Thanks to his initiatives, Culham quickly acquired a strong reputation in this field.

I first became acquainted with Keith and his work in 1959 through U.S.-U.K. exchanges in controlled fusion. Prior to 1958 the program had been secret, so after declassification several of us discovered we had similar ideas on solving the equations of plasma physics for realistic configurations. The classic Hain-Roberts

[5] paper was an early computational physics paper which described a numerical model for a pinch experiment, including results compared to experimental values.

Keith was a regular contributor to the *Journal of Computational Physics* throughout his career. He also contributed excellent chapters in *Methods in Computational Physics*, Volume 9 on "Plasma Physics" and Volume 16 on "Controlled Fusion" [19, 20, 39]. Keith was an Associate Editor of the *Journal of Computational Physics* from 1968 until his death in 1985.

Keith was a strong believer in publishing computer programs and was a founding Associate Editor of *Computer Physics Communications*. He became its Principal Editor a few years before his death. He also did a great deal to raise the level of program documentation through his advocacy of his OLYMPUS system for organizing programs.

Keith's interest in computing was widespread. He helped to found, and was chairman of, the Computing Group of the U.K. Institute of Physics and was at one time Chairman of the Oxford Branch of the British Computer Society. In 1965 he was a member of the influential Joint Working Group, set up by the U.K. Council for Scientific Policy and the University Grants Committee to advise on computers for research. He wrote position papers advocating the use of data communication networks to provide access to advanced scientific computers long before the existence of such networks.

In the last few years Keith had taken an active interest in economic theory, particularly as a member of the Basic Income Group. He was the author of the monograph, *Automation, Unemployment and the Distribution of Income* [54] and was writing another book on this subject at the time of his death. Ann labored beside him to get the book finished, and he himself brought a rare courage to his last months.

Keith will be remembered for generosity toward his scientific colleagues and his enthusiastic leadership in the development of computational physics. The contributors to this volume and his many other friends are glad we knew him.

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