DANIEL QUILLEN

Daniel Quillen died on 30 April 2011, at the age of 70. He was born in New Jersey, was an undergraduate at Harvard, and then a graduate student of Raoul Bott there. Immediately after finishing his thesis, on partial differential equations, he obtained a position at MIT, where he remained until he moved to Oxford as Waynete professor from 1984 to 2006.

He was among the most creative and influential mathematicians of his time, and was at home in many different areas of the subject. While still in his twenties he had the idea of axiomatizing a very general notion of homotopy which can be applied in the most diverse categories. Little noticed at the time, this has proved ever more important, and is now the basis of a whole area of algebraic geometry. In an amazing burst of activity around 1970 he not only created algebraic K-theory in the form we now use, and proved Serre's conjecture that projective modules over a polynomial ring are free, but also (simultaneously with Sullivan) proved the Adams conjecture about the stable homotopy groups of spheres, and discovered the link between formal group laws and cobordism theory which dominates the field of stable homotopy to this day. At the same time he introduced a completely new perspective on the cohomology of finite groups, and, again simultaneously with Sullivan, was a pioneer of rational homotopy theory.

Not long after that he turned to quite different kinds of mathematics and introduced the Quillen metric on the determinant line of an elliptic operator, and the notion of a super-connection in differential geometry, which has become a basic tool in index theory and quantum field theory. Later still his interests became focused on cyclic homology, and he made notable contributions in that field too.

He was awarded a Fields Medal in 1978.

He leaves his wife Jean, whom he married when they were both students at Harvard, their six children, and many grandchildren.

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