

Jacob T. Schwartz, 79, Restless Scientist, Dies

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Jacob T. Schwartz, a mathematician and computer scientist who did seminal research in fields as diverse as molecular biology and robotics, died Monday at his home in Manhattan. He was 79.

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Jack Manning/The New York Times

Jacob T. Schwartz, shown in 1983, was the founder of the computer science department at New York University.

He died in his sleep of liver cancer, his wife, Diana, said. He was chairman of the computer science department at [New York University](#), which he founded, from 1964 to 1980.

During a career that also included 42 years as a professor at the Courant Institute for Mathematical Sciences at the university, Dr. Schwartz wrote more than a dozen books and more than 100 scientific papers and research reports. At his death Dr. Schwartz was actively working on research in both molecular biology and logic.

Throughout his life, Dr. Schwartz, who was known as Jack, moved from one scientific field to the next. He was not a dilettante, but mastered each field in turn and then made significant contributions.

“He didn’t dabble, he plunged,” said W. Daniel Hillis, a computer scientist and founder of the Thinking Machines Corporation, an early maker of massively parallel thinking machines.

Invited to spend a summer consulting at the start-up firm in the early 1980s, Dr. Schwartz arrived and asked to see the documentation of the company’s CM-1 supercomputer, Dr. Hillis recalled. When he learned that the computer manual did not exist yet, he sat down and wrote it single-handedly.

His most influential publication was one of his first. As a mathematics graduate student at [Yale](#), he worked with Neilson Dunford. The two men cooperated on “Linear Operators,” which was published in three volumes in 1958 and remains in print today as a standard in the field, referred to by mathematicians simply as “Dunford and Schwartz.”

During the 1960s, Dr. Schwartz turned his attention to computing and became involved in the nascent field of computer science.

He spent time as a visiting scientist at I.B.M., which led to a collaboration with two I.B.M. researchers, John Cocke and Frances E. Allen. That led to pioneering work in optimizing compilers, software tools that are used by programmers to increase the performance of application programs. Dr. Allen would later become his second wife.

His background in mathematical algorithms led Dr. Schwartz to develop an early programming language called SETL, based on the mathematical theory of sets. The language was intended to make it possible for programmers to efficiently express algorithms. The language would later influence the designer of the Python programming language, widely used by programmers today.

The Courant Institute had financial support both from the [National Science Foundation](#) and from the Atomic Energy Commission and housed an early version of the Control Data Corporation 6600 supercomputer, designed by Seymour Cray.

Dr. Schwartz went out of his way to open the supercomputer to a generation of scientifically inclined high school students who were given access to the machine, which initially could be used by only one user at a time.

In the late 1970s, Dr. Schwartz's interests shifted toward parallel computing, and he designed an innovative early parallel computer called the Ultracomputer.

His later interests ranged as far afield as robotics, to which he made important theoretical contributions on how robots move around obstacles.

In the mid 1980s, he spent a year as the head of the [Defense Advanced Research Projects Agency's Information Processing and Techniques Office](#).

While there he shifted the research focus of the organization away from artificial intelligence.

In 1999, Dr. Schwartz became interested in molecular biology and began a multiyear collaboration with Michael Wigler, a professor at Cold Spring Harbor Laboratory.

The son of Ignatz and Hedwig Schwartz, Dr. Schwartz was born on Jan. 9, 1930, in the Bronx. He received his bachelor of science degree from [City College of New York](#) in 1949 and his master's degree and Ph.D. from Yale.

His marriages to Dr. Allen and to Sandra Weiner ended in divorce. Besides his third wife, Diana, survivors include his daughters, Abby Schwartz of Manhattan and Rachel Fainman of Winnipeg, Manitoba; and a sister, Judith Dunford, the widow of the literary critic [Alfred Kazin](#).

So fearsome was Dr. Schwartz's early reputation as a mathematician that when John Forbes Nash Jr., the [Nobel Prize](#) winning mathematician and economist, learned that he was attempting to solve an extremely challenging mathematical problem known as the "embedding problem," he

became agitated, apparently fearing Dr. Schwartz might beat him to a solution, said [Sylvia Nasar](#), author of “A Beautiful Mind,” a biography of Nash.

Nash’s own reputation in mathematics was cemented by his 1954 solution to the embedding problem, which was perceived by mathematicians as a more formidable challenge than game theory, for which he won his Nobel, she said.

“They were at some level of birds of feather, which was probably why Nash was so concerned,” she said.

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