# CITATION

## KILLIAN FACULTY ACHIEVEMENT AWARD
## 1989-90

**MARVIN L. MINSKY**
Donner Professor of Science

The James R. Killian, Jr. Faculty Achievement Award recognizes extraordinary professional accomplishments by MIT faculty members. Our committee is pleased to announce that the 1989-90 Killian Award Lecturer will be Marvin L. Minsky.

Two years ago the British magazine Nature began a book review of Marvin's book *The Society of Mind* with the statement "Marvin Minsky is the *eminence grise* of artificial intelligence." Marvin is indeed considered to be one of the founding fathers of Artificial Intelligence and he has exerted a marked influence on the field ever since. Sometimes a gadfly, he has produced a stream of provocative and controversial ideas which have shaped the identity and development of the field.

Marvin received a very broad education as an undergraduate at Harvard. When he graduated in 1950 he had studied, in some depth, physics, biology, music, psychology, and mathematics. He had also begun to think about building an electronic machine that would learn. While a graduate student at Princeton which led to a thesis about how a neural network might learn he returned periodically to Harvard to design and build an electronic learning machine with 300 vacuum tubes and numerous motors and clutches. After receiving his Ph.D. from Princeton in 1954 Dr. Minsky came back to Harvard for three years as a Junior Fellow. During this period he invented and patented the confocal scanning microscope. It was also during this period that the first conference on Artificial Intelligence was held at Dartmouth in 1956. The following year Marvin moved to MIT's Lincoln Laboratory and then a year later he was appointed to the MIT faculty as Assistant Professor of Mathematics.

In 1959 John McCarthy and Marvin Minsky initiated the MIT Artificial Intelligence Project which grew into what is now the Artificial Intelligence Laboratory. Marvin moved into the Electrical Engineering department as Associate Professor in 1961 and was promoted to full Professor in 1964. During the period 1964-73 he acted as Director of the Artificial Intelligence Laboratory. In 1974 he was appointed Donner Professor of Science.

The field of Artificial Intelligence has been divided, throughout its history, into two camps: the symbol manipulation camp and the connectionist camp. Minsky has made key contributions to both camps and has introduced concepts which serve as bridges between camps. His 1961 paper on *Steps toward Artificial Intelligence* was a seminal work subdividing symbol manipulation into heuristic search, pattern recognition, learning, planning, and induction. His most well-known contribution to connectionism is in the 1969 book *Perceptrons* by Minsky and Papert. This work points out limitations in connectionism as understood at that time. In 1974 Marvin introduced the concept of frames in an A.I.

Lab memo entitled *A Framework for Representing Knowledge*. The ideas introduced there have been subsequently developed and applied to the construction of expert systems. In 1987 Marvin published *The Society of Mind*, a bold speculation of how the human mind works. The main idea is that intelligence emerges from the cooperative behavior of a huge number of little agents no one of which is intelligent by itself. The book has been called controversial and disturbing but all agree that it is stimulating. The author calls it an "adventure story for the imagination".

Marvin's contributions have been recognized widely. In 1970 the Association for Computing Machinery presented him with its prestigious Turing Award. He was elected to serve as President of the American Association for Artificial Intelligence in 1981-82. Marvin is one of the very few that have been elected to membership in both the National Academy of Science and the National Academy of Engineering. In 1986 he was awarded an honorary doctorate from the Free University in Brussels.

It is indicative of Marvin's broad range of interests that his nomination for the Killian award was accompanied by supporting letters from all five schools of the Institute. Some indication of Marvin Minsky's style is conveyed by two quotations from these letters. The first quotation alludes to the springtime of his career: "... A half hour's conversation with Marvin was like watching a hundred bright balloons set free. And the ideas, the surprising associations, the physical metaphors for mathematical ideas, were *good*. A thesis topic a minute. Even the jokes had amazing depths." The second quotation alludes to the present: "Though often described by outsiders as an elder statesman of the field, he retains a child's sense of wonder and provocation, never content to accept the current wisdom and never comfortable with previous success. When there are too many committee meetings to attend, too many grant proposals to write and too much pressure for near-term results, it takes little more than a brief conversation with Marvin, with all of its mindbending oddities, roller-coaster pace, ample supply of non-sequiturs, and sheer enjoyment of pursuit, to remind me once again how much fun this all really is."

The selection committee is honored to place before you the name of Marvin L. Minsky as the Killian Awardee for 1989-90.

Lawrence S. Bacow
Richard L. Cartwright
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