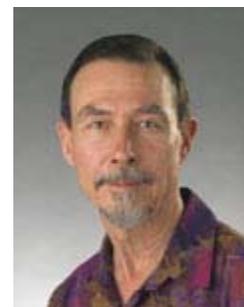


## Carver A. Mead

**Brief Biography:** Carver Mead is a key pioneer of modern microelectronics. His 40-year academic and industry career touches all aspects of microelectronics, from spearheading the development of tools and techniques for modern integrated-circuit design, to laying the foundation for fabless semiconductor companies, to catalyzing the electronic design-automation field, to training generations of engineers that have helped make the United States the world leader in microelectronics technology, to founding more than twenty companies, including Actel Corporation, Silicon Compilers, Synaptics, and Sonic Innovations.



Carver's career is characterized by an endless string of "firsts." He built the first GaAs MESFET, a device that is today a mainstay of wireless electronics. He was the first to use a physics-based analysis to predict a lower limit to transistor size; amazingly, back in 1972 he predicted devices so small we only began using them in 2000! His predictions, along with the notions of scalability that came with them, were instrumental in setting the industry on its path toward submicron technology. He was the first to predict millions of transistors on a chip, and, on the basis of these predictions, he developed the first techniques for designing big, complex microchips. He taught the world's first VLSI design course. He created the first software compilation of a silicon chip.

Halfway through his career he switched direction, teaming with Professor John Hopfield and Nobelist Richard Feynman to study how animal brains compute. The trio catalyzed three fields: Neural Networks, Neuromorphic Engineering, and Physics of Computation. Carver created the first neurally inspired chips, including the silicon retina and chips that learn from experience, and founded the first companies to use these technologies: Synaptics and Foveon.

Carver's teaching legacy is every bit as significant as his research. He taught the original founders of Sun Microsystems, Silicon Graphics, Silicon Design Labs, and countless others. His work in electronic design automation (EDA) created companies such as Silicon Compilers and Cascade Semiconductor Design. He and Ivan Sutherland created the computer science department at Caltech. In 40 years at Caltech he trained legions of engineers who have helped make the U.S. semiconductor industry unsurpassed. The 1980 textbook he coauthored with Lynn Conway, *Introduction to VLSI Design*, was standard training for a generation of engineers. His 1989 textbook, *Analog VLSI and Neural Systems*, trained interdisciplinary researchers who are poised today to revolutionize the frontier of computing and neurobiology. Although retired, Carver continues his teaching tradition today: His new passion is finding a better way to teach freshman physics, using the quantum nature of matter as a sole basis.

Every citizen of the United States is touched by Carver's work on a daily basis. From the high-speed transistors in fiber-optic switching networks and cellular telephones, to design methodologies that enable silicon integrated circuits in everything from computers to toaster ovens, to digital hearing aids, to the imager technology in digital cameras and video recorders, to the legions of engineers and researchers and university professors that he trained, Carver is ingrained in the national economy. His vision and creativity, unshakable optimism, inspiration, leadership, and sheer intellect have had an incalculable impact by any technology metric, be it economic impact or research results or careers shaped. Author George Gilder, in a 1988 article for *Forbes* magazine, said of Carver: "No single individual has exerted a more profound influence on modern human productivity." In 1999, Carver was honored with the Lemelson-MIT Prize in honor

of "...his many contributions to the field of microelectronics, which have led to a new business model for the industry and enabled a new wave of innovation in information technology." I know of no individual more deserving of a National Medal of Technology than Carver Mead.

*Larger Photo*