

Unsung innovators: Lynn Conway and Carver Mead

They literally wrote the book on chip design

By Gina Smith

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Computerworld - There is an analogy Lynn Conway brings up when trying to explain what is now known as the "Mead & Conway Revolution" in chip design history.

This was in contrast to the way chip designers at the time worked -- with different teams working on different aspects of chip design. The end result was usually far more complicated than necessary.

"We visualized a more streamlined way to do it, and we could see it was dynamite," she says. Their ideas also opened the door for innovative VLSI computer-aided design (CAD) tools that ran efficiently on personal computers. The small computers were then in just early stages of development. Conway and Mead saw that PCs would become ever more powerful as chip densities inexorably increased.

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Now, if we'd been typical academics, we'd have just written papers about our observations and that would have been it. But instead, we went out and did it," says Conway, noting that at the time -- circa 1977 -- "a lot of people didn't think the new methods sounded plausible.

"Fortunately," she adds, "we had some secret weapons for launching the new methods -- powerful new computers at PARC [Palo Alto Research Center at Xerox] and access to the ArpaNet [Advanced Research Projects Agency Network]-- enabling us to reach out and share ideas with collaborators and early adopters in many of the country's leading research universities, and get them directly involved in the revolution."

Conway taught a course at [MIT](#) in 1978 on the new methods. After a single semester and within just weeks of completing their designs, students were able to have a fabricated chip ready to test. In 1979, the course was expanded to 12 universities with similar results, using a new type of

law still had to go, and this was a huge motivating factor in all our work."

"Without us, a VLSI design revolution would have unfolded, but it wouldn't have happened as quickly or spread out as widely" says Conway. "Instead, there was a sudden breakout by Silicon Valley entrepreneurs in the 1980s, and the silicon gold rush that started there has been going on ever since."¶