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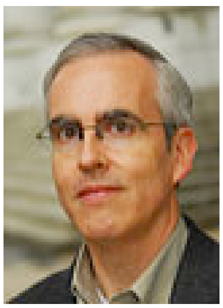
Electrical and Computer Engineering Honor Society

David Tuckerman

Venture Partner
CMEA Capital



Career Synopsis

David Tuckerman received the SB in EE, SB in Physics, and SM in EE from MIT. He then attended Stanford University on a Fannie & John Hertz Foundation Fellowship, receiving his PhD in 1984. His thesis work pioneered the technology of 'microchannel cooling', a techique that is in commercial use today for cooling very high heat-flux devices such as solid-state lasers. He ran R&D projects at Lawrence Livermore National Laboratory, then left to co-found nChip, a silicon valley start-up company in multichip packaging. nChip was ultimately acquired by Flextronics International Ltd, after which David went back to Stanford for an MBA degree, then joined CMEA, a venture capital firm. After 5 years as a venture capitalist, he joined Tessera Inc., a provider of advanced IC packaging technologies, as Chief Technical Officer. He held the CTO position for 6 years, during which the company executed a successful IPO. He is an IEEE Fellow.

Career Highlights

The first highlight was the opportunity to work at a world-class R&D laboratory as an MIT "co-op" student. I spent a total of 18 months at the IBM Thomas J. Watson Research Center working on Josephson junction computer technology. I was designing and testing 10-picosecond superconducting logic devices in 1978, at a time when semiconductor technology was still in the nanosecond time scale. As a college junior, I published my first paper, which was a great thrill.

The next highlight was my PhD thesis research. While thinking about the problem of cooling dense arrays of integrated circuits in high-performance computers, I came up with the concept of microchannel cooling (ultraminiature water-cooled silicon heat sinks). Although I was in the Stanford E.E. department, I had a very open-minded thesis advisor, Prof. Fabian Pease, as well as an independent source of financing (the Hertz Foundtion fellowship), so I was free to explore nontraditional and interdisciplinary problems. I self-educated myself about heat transfer (traditionally a province of mechanical engineers and chemical engineers, not something an EE normally ever studies), and combined that knowledge with the silicon microfabrication techniques that were just emerging in the field of MEMS. The result was a significant breakthrough in IC packaging technology - the ability to cool a centimeter-sized IC chip that was dissipating over a kilowatt of power. I was tremendously gratified and honored to receive a Best Paper award from the IEEE, and a Best PhD Thesis award from the Hertz Foundation.

Deciding to co-found a start-up company in 'Silicon Valley' was the next major highlight. It felt risky at the time, and I was working the longest hours that I'd ever put in in my life, but I learned an enormous amount about entrepreneurship, and after 6 years of work we successfully sold the company.

The most recent highlight so far was working at a company, Tessera, that went public while I was its CTO. A successful IPO is of course the standard Silicon Valley dream of entrepreneurs.

Education and Career

First of all, I believe MIT offers one of the finest undergraduate educations in the world for people who are interested in careers in science, technology, and/or engineering. The level of intellectual rigor in the MIT curriculum is awesome, and I believe I owe much of my later successes to my MIT undergraduate education. Beyond that, I think the decision to double-major in Physics, in addition to my primary major of Electrical Engineering, was the other key to success. When you come down to it, everything ultimately derives from the basic laws of physics. Most all engineering fields are derived from physics in some way, and there are underlying concepts such as force, resonance, waves, Fourier analysis, thermodynamics, and quantum effects that show up repeatedly in many different engineering fields (mechanical, chemical, materials, civil, aeronautical, nuclear) . Having that basic physics background enabled me to see the unifying threads in different branches of engineering and quickly pick up key concepts in fields that fields that most people think of as separate and distinct. I think the most significant innovations in technology come from combining insights from disparate fields; certainly microchannel cooling was an example of an interdisciplinary innovation. I'm not saying that everyone needs to double major in Physics, but every engineer should certainly take several basic physics courses and learn them very well. It will pay big dividends in the long run.

Advice to Engineering Graduates

As I said before, take a few basic physics classes, and learn them so well that the key concepts become second nature. If at all possible, go to a school that offers a 'co-op' program, and take full advantage of it; if there is no such program, try your best to find summer jobs that relate in some way to engineering. Try to find a professor that is doing research in something that interests you, and see if you can work part-time during the year. Choose your major and your course selections by what you are passionate about, and not just by what you perceive the current job market to be; no one can predict how job markets will evolve beyond a few years out. The saying 'Do what you love, the money will follow' really is true.