Celebrating Women Innovators

Dr. Tsu-Jae King Liu
Vice Provost, Academic and Space Planning,
TSMC Distinguished Professor in Microelectronics,
College of Engineering,
University of California, Berkeley

"Being an educator is a powerful way to help others improve their quality of life."

Auspicious Beginnings
As a high school student in the late 1970s, Tsu-Jae King Liu was given a tour of Xerox Palo Alto Research Center (Xerox PARC) where her interest in computing was sparked by a demonstration of the Alto computer with its mouse-driven graphical user interface. She went on to earn B.S., M.S. and Ph.D. degrees in Electrical Engineering from Stanford University.

From Industry to Academia
Dr. Liu held a staff research position at Xerox PARC before launching her academic career at the University of California, Berkeley, where she has devoted more than two decades of her career to educating and mentoring students while shaping academic and research programs. After she was promoted to full Professor, she took a two-year industrial leave to gain additional industry experience as Senior Director of Engineering at Synopsys, Inc.

Currently, she holds a distinguished professorship endowed by TSMC in the Department of Electrical Engineering and Computer Sciences (EECS), in the College of Engineering at U.C. Berkeley where she also serves as Vice Provost of Academic and Space Planning. Her previous administrative positions within the College of Engineering include associate dean for research and EECS department chair.

Groundbreaking Research & Development
Dr. Liu has received acclaim as one of the developers of the "FinFET" transistor, which is considered a revolutionary advancement in the progression of integrated-circuit technology to enable ever higher performance microprocessors, the brains of electronic devices.

She holds more than 90 patents and has received numerous awards for her research, including the Intel Outstanding Researcher in Nanotechnology Award (2012) and the SIA University Researcher Award (2014). Currently, her research is focused on advanced materials, process technology and devices for energy-efficient electronics.

In July 2016, Dr. Liu was invited to join Intel's board of directors.[1] Shortly thereafter, the CAWIT communications team had the opportunity to talk with Dr. Liu about the role of women in technology. She shares some of her insights below.

Dr. Liu on the Role of Women in Technology

"Being an educator is a powerful way to help others improve their quality of life. I found opportunities to teach from the time I was a teenager. I gave piano lessons, taught Sunday school, was a volunteer tutor during college, and then a graduate student instructor.

"As I considered career opportunities, I wanted to do something that would have a positive impact. My interest in engineering was piqued by electronic medical devices used to diagnose and treat people.

"The most important lessons I've learned and shared with my students are to always be open to learning new things and to find mentors and advocates who can help you learn and point out opportunities you may not have considered—and to listen to their advice and take some risks in order to grow. I had to be convinced to apply for a faculty position at U.C. Berkeley, because I did not feel qualified to be considered. In 2014, I was appointed to serve as Chair of the Department of Electrical Engineering and Computer Sciences (EECS) at U.C. Berkeley.

"As Department Chair, I worked with faculty, staff and student organizations to address the issue of lack of diversity in engineering at all levels from pre-college, undergraduate, and graduate to career. As one example, to raise the visibility of rising female stars in our field, I organized a workshop to bring them to Berkeley to become mutually acquainted with our faculty. This initiative has led to the hire of multiple new women faculty members over the past two years. The benefits to our students (both female and male) already are apparent.

"Dr. Belle Wei attended this workshop and followed up with me afterwards to invite me to work with her as part of the Center for Advancing Women in Technology (CAWIT). I initially served on CAWIT's governing board. In early 2015 we talked with companies about sponsoring a new initiative to increase the participation of women in technology by creating new educational pathways for them in college. They were supportive and helped us to hone the vision for the Technology Pathways Initiative (TPI).

"Despite the good work of other organizations and initiatives to increase the number of women in technology, the nationwide trend of decreasing percentage of women graduating with major or minor degrees in computer science has persisted for decades. Therefore, TPI is designed to take a complementary approach, that is to bring computing to fields of study that currently have higher percentages of women—and more broadly to all college students. Here's why.

“Advances in information and communications technology (ICT) touch virtually every field of human endeavor; that is, the application of ICT spans across disciplines and industries. As the digital economy grows, our country faces a long-term deficit of workers skilled in computing. To resolve this deficit and maintain our technological advantage globally, we must produce more technology-capable and technology-competent graduates. This is precisely why the Technology Pathways Initiative was established: To create new degree programs and produce more college graduates who will be the interdisciplinary thinkers and innovators of tomorrow’s workforce. Women and minorities are the underrepresented majority of students in our public universities, which form the pipeline of talent to fill tomorrow’s jobs. They are vital to solving our workforce crisis and to building a stronger economy for the benefit of society.

“To understand and be able to apply science and technology to solve complex challenges is to make impactful contributions to society.”

CAWIT is honored to feature Dr. Liu in our series on Women Innovators. Her vision, commitment, accomplishments and history of contributions to her field exemplify the kind of trajectory we envision for more women in technology in the years to come. Learn more at cawit.org.