Keynotes

Internet of Things: History and Hype, Technology and Policy
Dr. Margaret Martonosi, *Princeton University*

Abstract
The idea of an emerging Internet of Things (IoT) is currently captivating both technologists and society at large. Although IoT techniques have their roots in ideas that are decades old, their increasingly widespread deployments have made them a hot topic these days, frequently discussed and hyped. As many as 50B networked devices are envisioned by 2020, and proponents of IoTs see a world where embedded sensing and control techniques help vehicle traffic flow more smoothly, where environmental sensing and data analysis facilitates better use of natural resources like water, and where personalized health monitoring helps individuals improve their quality of life. On the other hand, properly addressing policy concerns around security and privacy may play a role in IoT's adoption and success. My talk will discuss key technology and policy challenges for future IoT applications and devices. Overall, I will be drawing from both technical experiences and trends, as well as from policy perspectives gained during a one year fellowship doing technology policy within the U. S. Department of State.

Bio
Margaret Martonosi is the Hugh Trumbull Adams '35 Professor of Computer Science at Princeton University, where she has been on the faculty since 1994. From August 2015-2016, she served as a Jefferson Science Fellow doing international aspects of technology policy within the U. S. Department of State. Martonosi's technical research focuses on computer architecture and mobile computing, particularly power-efficient systems. Past projects include the Wattch power modeling tool used by thousands of engineers worldwide, and the ZebraNet mobile sensor network, which was deployed for wildlife tracking in Kenya. Martonosi holds affiliated appointments in Princeton's Electrical Engineering Department, its Center for Information Technology Policy, its Environmental Institute, and its Andlinger Center for Energy and the Environment. From 2005-2007, she served as Associate Dean for Academic Affairs for the School of Engineering and Applied Science. From 2016-2022, she holds (in addition to her primary position at Princeton) a visiting position as Andrew Dickson White Visiting Professor-At-Large at Cornell University.

Martonosi is a Fellow of both IEEE and ACM. Her major awards include Princeton University's 2010 Graduate Mentoring Award, the Anita Borg Institute's 2013 Technical Leadership Award, NCWIT's 2013 Undergraduate Research Mentoring Award, the 2015 Marie Pistilli Women in EDA Achievement Award, and ISCA's 2015 Long-Term Influential Paper Award. Martonosi is an inventor on seven granted US patents, and has co-authored two technical reference books on power-aware computer architecture. She serves on the Board of Directors of the Computing Research Association (CRA).

Low Power CPU: From Mobile to Wearable & IoT
Dr. Uming Ko, *MediaTek Inc.*

Abstract
With the landmark introduction of Smartphone in 2007, Mobile Internet and computing took off and the associated data bandwidth has ever-since grown exponentially resulting in the ever-increasing computing requirements. However, mobile CPU will soon hit the frequency and thermal limits. Thus, mobile clients are rapidly moving to multi-core CPU/GPU with system-adaptive power management, thermal throttling, and heterogeneous multi-processing. The insatiable computation need, coupled with the explosion of Internet-of-Things (IoT) that demands long battery operation, further presents major thermal and energy gaps. Consequently, many innovations are desperately needed to enable the ubiquitous ecosystem that promises to provide ample possibilities to enhance and enrich everyone's life.

Bio
Uming Ko is the Vice President of Technology and General Manager of the High-performance Processors Technology at MediaTek Inc., Taiwan. He received his B.S. degree in Electrical Engineering from National Tsing-Hua University, Taiwan and his M.S. and Ph.D. degrees from the University of Texas. He first worked at AMD and then joined Texas Instrument (TI) in 1986. He was elected to TI Fellow in 2000 for his innovation on industry's most energy-efficient DSP processor—the TMS320C55x DSP. In 2005, Dr. Ko was recognized as a TI Senior Fellow for his technical leadership in ultra-low-power design and innovations of SmartReflex Power and Performance Management technology. At MediaTek, he oversees and leads the development of high-performance processors. Dr. Ko has published 44 technical papers and holds 48 US patents. He received 12 national-level and industrial awards including the 2006 Asian American Engineer of the Year Award in the US. He is a Fellow of the IEEE.