VINCENT MEYER COLLOQUIUM

Professor Cheol Seong Hwang

Professor Cheol Seong Hwang received his M.Sc. and Ph.D. in Inorganic Materials Science and Engineering from the Seoul National University. In 1993 he joined the Materials Science and Engineering Laboratory of NIST as a postdoctoral fellow. He joined Samsung Electronics in 1994, making significant contributions to the fields of semiconductor memory devices and researching high-k dielectrics including $(Ba,Sr)TiO_3$. Since 1998 he has been a professor in Materials Science and Engineering at Seoul National University. His current interests include high-k gate oxide, DRAM capacitors, new memory devices including RRAM/PRAM, ferroelectric materials and devices, negative capacitance effect, thin film transistors and neuromorphic computing devices and materials.

Professor Hwang has published close to 600 research papers, a Springer volume "Atomic Layer Deposition for Semiconductors", and holds over 100 patents. He has recieved numerous prestigious awards, including a Humboldt fellowship, the Korean government's presidential young scientist award, an AP Faculty Excellence Award, and Inchon Award. He is a member of the Korean Academies of Science and Technology, and Engineering, and a Fellow of the Royal Society of Chemistry.

Memristors for energy-efficient new computing paradigms
Wednesday, December 11, 2019 ■ 12:30 ■ Meyer Bldg., Auditorium 1003
[Refreshments at 12:30, the lecture will start at 12:45]

Abstract: Since the 2000's, research on memristors, either as non-volatile memory elements or as critical components for computing paradigms, has been extremely active. In this review, memristors are examined from the frameworks of both von Neumann and neuromorphic computing architectures. For the former, a new logic computational process based on the material implication is discussed. It consists of several memristors which play the roles of combined logic processor and memory, called stateful logic circuits. In addition, the memory in this circuit is basically non-volatile, so that the energy required for the data refresh is also saved. Neuromorphic, or cognitive, computing refers to a computing paradigm that mimics the human brain. Several fundamental ideas for utilizing memristors and recent progress in this setting will be reviewed. Finally, material and processing issues and the future of the field will be discussed.

Professor Hwang will also deliver an additional lecture
Modeling of negative capacitance in ferroelectric thin films

Tuesday, December 10, 2019 ■ 14:30 ■ Meyer Bldg., Room 861
[Refreshments at 14:15, the lecture will start at 14:30]

For further information see:
http://webee.technion.ac.il/Vincent-Meyer-Colloquium
December 2019

Technion