

Developing Status and Trend for Nonvolatile Memory

Biography of Prof. Ming Liu

Ming Liu received the B.S. and M.S. degrees in semiconductor physics and device from Hefei Polytechnic University, Hefei, China, in 1985 and 1988, respectively, and the Ph.D. degree in microelectronics from Beijing University of Aeronautics and Astronauts, China, in 1998. From 1998 to 1999, she was a Postdoctoral Scholar in the Chinese Academy of Sciences (CAS). She joined the Institute of Microelectronics, CAS, in 2000. She is currently the Director of the Key Laboratory of Nanofabrication and Novel Devices Integration Technology and the Key Laboratory of Microelectronics Devices and Integrated Technology. In 2015, she was selected as an Academician of Chinese Academy of Sciences. Her research interests are semiconductor materials, integrated-circuit processing, nanofabrication, nano-electronics, molecular electronics, and non-volatile memory.



Abstract:

The common memory technologies used in the traditional memory hierarchy, are increasingly constrained by fundamental technology limits. The increasing leakage power for SRAM and refresh dynamic power for DRAM has posed challenges to circuit and architecture designers. Emerging memory technologies such as spin transfer torque RAM (STT-RAM), phase-change RAM (PCRAM), and resistive RAM (RRAM) are being explored as potential alternatives to existing memories in future computing systems. Especially, due to the excellent compatibility with CMOS process and ease of 3D integration, RRAM provides a promising potential for embedded and standalone application. In this talk, current status of RRAM technology will be discussed, including switching mechanism, array architecture, 3D integration, target applications, challenges and future trends. A new era of convolutional computer architectures could be expected after the mature of emerging new NVM technologies.