

Track 4 Memory Technologies

10 March 2025

10:30am to 12:30pm Track 4 Memory Technologies M-4-1

Venue: Grand Hall A

10:30am M-4-1-1 [Invited]

Content Addressable Memory Hierarchies for Computing in Memory

John Paul Strachan, Institute (PGI-14) Neuromorphic Compute Nodes, Forschungszentrum Juelich/RWTH Aachen University, Germany

10:50am M-4-1-2 [Invited]

An Efficient Pipeline Programming Scheme Based on 40nm PCM Compute-in-Memory Chip for CNNs

Yuchao Yang, Peking University, China

11:10am M-4-1-3 [Invited]

HfO₂-Based Ferroelectric Field-Effect Transistors for Next-Generation Storage and In-Memory Computing Applications

Chengji Jin, Xidian University, China

11:30am M-4-1-4 [Invited]

Hafnia-based XP-FeRAM: A Novel High-speed and Low-power Cross-point Ferroelectric Memory for Data-intensive Applications

Qianqian Huang, Peking University, China

11:50am M-4-1-5 [Invited]

Conductive atomic force microscopy to assess the reliability of emerging memories

Mario Lanza, National University of Singapore, Singapore

12:10pm M-4-1-6 [Invited]

Recent advances in on-chip learning with organic neuromorphic circuits

Yoeri van de Burgt, TU Eindhoven, The Netherlands

11 March 2025

9:25am to 10:50am Track 4 Memory Technologies T-4-2

Venue: Conference Hall 4&5

9:25am T-4-2-1 [Invited]

A Perspective on Low Voltage Operating Ferroelectric Random-Access Memories Based on Ferroelectric (Hf,Zr)O₂

Min Hyuk Park, Seoul National University, South Korea

9:45am T-4-2-2 [Invited]

Reliability Optimization in Hafnium Oxide Based Ferroelectric Field-effect Transistors (FeFETs)

Kechao Tang, Peking University, China

10:05am T-4-2-3

Comprehensive Investigation of the Disturb and Retention Issues in Scaled FeNAND Arrays

Yuejia Zhou, Kechao Tang, Ru Huang, Peking University, China

11 March 2025

9:25am to 10:50am Track 4 Memory Technologies T-4-2

Venue: Conference Hall 4&5

10:20am T-4-2-4

Unveiling the Role of Oxygen Vacancy Inhomogeneity in Enhancing the Reliability of Ferroelectric HfO₂/ZrO₂ Superlattice Structures

Boyao Cui, Maokun Wu, Sheng Ye, Xuepei Wang, Yuchun Li, Yishan Wu, Yichen Wen, Jinhao Liu, Zhigang Ji, Hongliang Lu, David Wei Zhang, Runsheng Wang, Ru Huang, Shanghai Jiaotong University, China

10:35am T-4-2-5

A Novel Superlattice HfO₂-ZrO₂ Ferroelectric Tunnel FET for Overall Improvement in Memory Window, EOT and Disturb Immunity

Shaodi Xu, Zhiyuan Fu, Shengjie Cao, Yue Yu, Hao Zheng, Qianqian Huang, Ru Huang, Peking University, China

11 March 2025

11:00am to 12:30pm Track 4 Memory Technologies T-4-3

Venue: Conference Hall 4&5

11:00am T-4-3-1 [Invited]

Nanorods-based Memristors : Advancing Bio-inspired System and Neuromorphic Computing

Jung Ho Yoon, Sungkyunkwan University (SKKU), South Korea

11:20am T-4-3-2 [Invited]

High Density and High Reliability (H2DR) RRAM for Advanced Memory Technology

Zongwei Wang, Peking University, China

11:40am T-4-3-3

4.6-bits-per-cell Resistive Probabilistic-bit Computing for High-efficient Evaluation of Bio-Genomic Evolution Achieving 6.25x Acceleration of Data-operations

E-Ray Hsieh, Kai-Wen Cheng,, National Central University, Taiwan

11:55am T-4-3-4

An RRAM-based Multi-Mode and Pipelined Pooling Scheme in Computing-in-Memory for Convolutional Neural Networks

Yi Gao, Yimao Cai, Ru Huang, Zongwei Wang, Lin Bao, Peking University, China

12:10pm T-4-3-5

4F2/bit Memristive Multi-bit Content Addressable Memory Enabled by Nonlinear Encoding for In-Memory Similarity Search

Tong Hu, Yibai Xue, Yingjie Yu, Wenbin Zuo, Jiancong Li, Yi Li, Xiangshui Miao, School of Integrated Circuits, Huazhong University of Science and Technology, China

11 March 2025

3:00pm to 4:30pm Track 4 Memory Technologies T-4-4

Venue: Conference Hall 4&5

3:00pm T-4-4-1 [Invited]

Integration of 2D Ultrafast Flash Memory: From Device to Chip

Chunshun Liu, Fudan University, China

3:20pm T-4-4-2 [Invited]

High-Frequency Capacitance Measurement Techniques and Their Applications in Memory Technology Development

Liang Zhao, Zhejiang University, China

3:40pm T-4-4-3 [Invited]

Reconfigurable magnonic devices for spin-wave manipulation on the nanoscale

Huajun Qin, Wuhan University, China

4:00pm T-4-4-4

Adaptive Update Precision with Reduced Iterative Write Cycles for Efficient Training Neural Networks on ECRAM arrays

Peihong Li, Peng Chen, Peng Lin, Gang Pan, Zhejiang University, China

4:15pm T-4-4-5

Enabling Artificial Spiking Sensory Neurons with a Single Flexible VO₂ Mott Memristor for Neuromorphic Sensing

Chuanyu Han, Shujing Zhao, Shengli Fang, Shi Quan Fan, Weihua Liu, Xin Li, Li Geng, Xi'an Jiaotong University, China

11 March 2025

4:40pm to 6:00pm Track 4 Memory Technologies T-4-5

Venue: Conference Hall 4&5

4:40pm T-4-5-1

Demonstration of Reliable Magnetic Shift Register Reading Using 50 nm MTJs on CMOS IC towards 3D Ultra-High Density Memory

Susumu Hashimoto, Nobuyuki Umetsu, Yasuaki Ootera, Jun Iwata, Michael Quinsat, Yoshihiro Ueda, Naoharu Shimomura, Hiroki Tokuhira, Shinji Miyano, Masatoshi Yoshikawa, Tsuyoshi Kondo, Masumi Saitoh, Masaki Kado, Kioxia Corporation, Japan

4:55pm T-4-5-2

A novel transistor free design of SOT-MRAM written by unipolar current with record bit cell size (15F²)

Meiyin Yang, Lei Zhao, Bowen Yang, Bowen Shen, Yanru Li, Peiyue Yu, Jianfeng Gao, Ruipeng Shi, Zhuangzhuang Ye, Shuo Xu, Yan Cui, Xiaolei Yang, Ming Wang, Shikun He, Jun Luo, Institute of Microelectronics, CAS, China

5:10pm T-4-5-3

Temperature Dependent Back-hopping in Spin Transfer Torque Switching of Perpendicular Magnetic Tunnel Junctions

Yapeng Zhao, Fuzhou University-Jinjiang Joint Institute of Microelectronics and School of Physics, Information Engineering and Microelectronics, Fuzhou University, Fuzhou 350108, China

11 March 2025

4:40pm to 6:00pm Track 4 Memory Technologies T-4-5

Venue: Conference Hall 4&5

5:25pm T-4-5-4

Thermal Stability of TiO₂ Channel FE-VNAND: From Fabrication to High-Temperature Operation

Xujin Song, Dijiang Sun, Xiaoyan Liu, Jinfeng Kang, Peking University, China

5:40pm T-4-5-5

Comprehensive Modeling of Ferroelectric Tunnel Junctions: Variability Analysis and Device Design

Jiajun Qiu, Ning Ji, Hao Li, Ning Feng, Runsheng Wang, Ru Huang, Lining Zhang, Peking University, China

5:55pm T-4-5-6

Data Retention in co-doped HZO FeCAPs: Roles of FE Thickness and Thermal Budget

Justine BARBOT, Markus Peller, Isaac Emanuel Robert, Kerstin Bernert, Hannes Maehne, Steffen Thiem, David Lehninger, Ayse Sünbül, Konrad Seidel, Thomas Kämpfe, X-FAB Semiconductor Foundries AG, Germany

12 March 2025

11:00am to 12:30pm Track 4 Memory Technologies W-4-6

Venue: Multifunction ROOM 2&3

11:00am W-4-6-1

Oxidation of TiN Interface and Improvement of AlN Intercalation of ZrO₂ Capacitor in DRAM

Songming Miao, Xinyi Tang, Yuanbiao Li, Guangwei Xu, Di Lu, Shibing Long, University of Science and Technology of China, China

11:15am W-4-6-2

Low-Voltage Multi-Level Flash Memory Based on Intra-Float-Gate Charge Transfer

Yifan Chen, Qing Wang, Zongwei Shang, Mingmin Shi, Xijun Zhou, Xiaoyan Xu, Xia An, Ru Huang, Ming Li, Haixia Li, Peking University, China

11:30am W-4-6-3

Oxygen Vacancy-Zr Content Synergy for Morphotropic Phase Boundary Towards High-performance DRAM Applications

Jinhao Liu, Xuepei Wang, Maokun Wu, Boyao 崔, Yichen Wen, Yishan Wu, Sheng Ye, Pengpeng Ren, Runsheng Wang, Zhigang Ji, Ru Huang, Shanghai Jiaotong University, China

11:45am W-4-6-4

Research on Oxidizer Engineering of ALD for Industrial Production of ZrO₂ Capacitor in DRAM

Xinyi Tang, Songming Miao, Yuanbiao Li, Di Lu, Shibing Long, Guangwei Xu, University of Science and Technology of China, China

12:00pm W-4-6-5

Characterization of a 1T-Floating Body DRAM Cell in Bulk Silicon MOSFETs for Cryogenic Memory Applications

Hengxu Guo, Yuanke ZHANG, Yuefeng Chen, Haoyu Sheng, Chi Fang, Guoping Guo, Chao Luo, University of Science and Technology of China, China

12:15pm W-4-6-6

Optimizing SiN Composition for Enhanced Charge-Trapping in Next-Generation 3D NAND Flash Memories

Tomoya Nagahashi, Hajime Karasawa, Ryota Horiike, Atsushi Oshiyama, Kenji Shiraishi, Nagoya University, Japan

12 March 2025

3:00pm to 5:00pm Track 4 Memory Technologies W-4-7

Venue: Multifunction ROOM 2&3

3:00pm W-4-7-1

Ag:SiO_x-based Volatile Memristors for Dendritic Computations

Ruiqi Chen, Xiaoyan Liu, Yulin Feng, Nan Tang, Yiyang Chen, Hao Ai, Haozhang Yang, Zheng Zhou, Lifeng Liu, Jinfeng Kang, Peng Huang, Peking University, China

3:15pm W-4-7-2

A High-Throughput Parasitic TRNG in Self-Rectifying Memristor based CIM for Edge Secure Computing

Yingjie Yu, Shengguang Ren, Yuyang Fu, Jiancong Li, Puyi Zhang, Yi Li, Xiangshui Miao, School of Integrated Circuits, Huazhong University of Science and Technology, China

3:30pm W-4-7-3

Optimization of RRAM Read Performance and Area Efficiency: A Large-Scale and Low-Parasitic Array with Novel Interconnection Schemes

Shengyu Bao, Yuhang Yang, Zongwei Wang, Linbo Shan, Qishen Wang, Yimao Cai, Ru Huang, Peking University, China

3:45pm W-4-7-4

Improving the Reliability of 40nm RRAM Chip by Pre-cycle Operation

Ruofei Hu, Yilong Huang, Chengxiang Ma, Qianze Zheng, Kaimeng Liu, Yuelin Jiang, Siyu Chen, Jianshi Tang, Dong Wu, Bin Gao, He Qian, Huaqiang Wu, Tsinghua University, China

4:00pm W-4-7-5

Endurance Optimization of 40nm RRAM towards 10⁶ cycles by Tuning the Stoichiometry of TiN Bottom Electrode

Chengxiang Ma, Qianze Zheng, Ruofei Hu, Yilong Huang, Kaimeng Liu, Yuelin Jiang, Siyu Chen, Jianshi Tang, Dong Wu, Bin Gao, He Qian, Huaqiang Wu, Tsinghua University, China

4:15pm W-4-7-6

Scalable in-memory Walsh-Hadamard Transform for image compression

Jing Tian, Huai-Zhi Pei, Jian-Cong Li, Xiao-Di Huang, Yi Li, Xiang-Shui Miao, Yi-Bai Xue, Huazhong university of Science and Technology, China

4:30pm W-4-7-7

Rapid and Extensive Conductance Modulation in MoO_x based Electrochemical Random-Access Memory for Spiking Neuromorphic Systems

xiaoci liang, Dongyue Su, Younian Tang, Bin Xi, Chunzhen Yang, Huixin Xiu, Jialiang Wang, Chuan Liu, Mengye Wang, Yang Chai, Sun Yat-Sen University, China

4:45pm W-4-7-8

The Demonstration of Scalable-HZO/ZrO₂ FeFET with Large Memory Window of 2.3V for 3bit-per-cell, Immediate Read after Write, High Endurance of 10⁹ cycles, and The High Accuracy of 92% for Machine Learning.

Huang Sheng Tsang, National Central University, Taiwan

Updated: 17 February 2025