Call for Participation

The 34th Microelectronics Design & Test Symposium (IEEE MDTS 2025)

May 19 – 21, 2025

Crowne Plaza Albany - The Desmond Hotel in Albany, New York

http://mdts.ieee.org

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Contact

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About MDTS

The IEEE Microelectronics Design & Test Symposium (MDTS) provides a forum for academia and industry to learn about the latest advances in microelectronics and to share research and design work. The Symposium environment fosters academic-industry collaboration with tutorials, a guided panel, invited speakers, original research papers, including hosting student original research communications.

The Program Committee invites researchers and practitioners to submit tutorial, panel, and special session proposals. Proposals must include title, topic abstract, speakers' short bio, and a list of contributing papers. The committee also encourages authors to submit original, unpublished papers on any of the topics of interest. Submissions may be 4 to 6 pages for full papers and two-pages for extended summaries. Authors of extended summaries can indicate during the submission if they would like to be considered for expanding the extended summary to a full paper by the final paper submission deadline with further review Accepted full papers presented at the symposium have the option of being published in IEEE *Xplore*®. Selected papers will be invited for possible publication in the Journal of Electronics Testing: Theory and Applications. Details can be found on the **mdts.ieee.org** website.

Papers, tutorials, posters and speakers are solicited in the following topics of interest, but not limited to the following:

- **Electronic Testing Technologies**
- **Design for Test**
- **Electronic Design Automation (EDA)**
- **Yield Analysis and Optimization**
- **Hardware and System Security**
- **Reliability and Resilience**
- **Analog/Mixed Signal/RF Circuits and Systems**
- **Nanoelectronics, Magnetic, Optoelectronics Materials and Devices**
- **Neuromorphic Engineering**
- **Quantum Computing**
- **Power Electronics**
- **Biomedical, Photonics, and Quantum Electronics**
- **Sensory Circuits and Systems**
- **Signal Processing**
- **Artificial Intelligence (AI) in Electronics**
- **Beyond-CMOS Nanoelectronics**
- **Heterogeneous Integration and Packaging**
- **Wide Bandgap Technologies**
- **Emerging Technologies and Applications**

Best Student Paper Award

To encourage student participation in the microelectronics design and test research community, MDTS has sessions dedicated to student presentations and includes a Best Student Paper Award. We believe that it is important to integrate students into the microelectronics research and development community early in their careers so that they can experience the excitement of direct interaction with their peers.

2024 Sponsors and Corporate Supporters

To support MDTS-2025, application form is available on mdts.ieee.org; or email chenxinghao@ieee.org.

IEEE Region 01 – Northeastern USA **IEEE Schenectady Section**

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Plenary Speakers

Moitreyee Mukherjee Roy
Program Director, Heterogeneous Integration and Chiplet Technology, IBM Research
"Opportunities and challenges in the era of chiplets"

Wenke Weinrich
Deputy Institute Director and Division Director, Center Nanoelectronic Technologies, Fraunhofer IPMS
"European Pilot Line APECS – Advanced Packaging and Heterogeneous Integration for Electronic Components and Systems"

Qiaoyan Yu
Program Director, Division of Computer and Network Systems (CISE/CNS), National Science Foundation
"Research and Education Opportunities in NSF SaTC Programs"

Samuel Pagliarini
Special Professor, Dept. of Electrical and Computer Engineering, Carnegie Mellon University
"REPQC: Reverse Engineering and Backdooring Hardware Accelerators for Post-quantum Cryptography"

David Pan
Silicon Laboratories Endowed Chair, Chandra Department of Electrical and Computer Engineering, The University of Texas at Austin
"Toward Agile and Intelligent Analog/RF IC Design Automation"

Panel Discussion

AI Power and Security Impacts: Wide-Bandgap, RF, Power Electronics and Chiplets

Panelists

- **Dr. Wenke Weinreich**, Fraunhofer IPMS
- **Prof. Samuel Pagliarini**, Samuel Pagliarini
- **Prof. David Z. Pan**, Univ. of Texas at Austin
- **Prof. Dean Sullivan**, Univ. of New Hampshire

Poster Session

Research, refreshments, an excellent opportunity to share ideas, receive feedback, and build connections.

MDTS Credentialing Program

Attending MDTS 2025 counts for Professional Development Hours (PDH).

Special Sessions

Special Session 1: Emerging Materials, Devices, Circuits, and Processing for Beyond-CMOS Nanoelectronics and Heterogeneous Integration

- *"Harnessing Ion Dynamics on 2D Materials: Innovations for Next-Generation Neuromorphic Applications,"* Ke Xu (Rochester Institute of Technology)
- *"Strain Engineering 2D Van der Waals Devices,"* Stephen Wu (University of Rochester)
- *"Addressing Throughput and Scalability Challenges in Time-domain Neuromorphic Computing,"* Hagar Hendy, Elaine Greenfield, Huayuan Han, Jacob O'Donnell, Ke Xu, Cory Merkel, Tejasvi Das (Rochester Institute of Technology)
- *"Location-Controlled Chemical Vapor Deposition of MoS2 for High-Performance Field-Effect Transistor Arrays,"* Chu-Te Chen, Anthony Cabanillas, Fei Yao, Huamin Li (State University of New York at Buffalo)

Special Sessions 2 & 4: Analog/RF and Mixed-Signal Circuit Design and Test

- *"Watermarking Superconducting Electronic Circuits in Classical and Quantum Computers,"* Ayisat Adedokun, Yerzhan Mustafa, Selçuk Köse (University of Rochester)
- *"A 7nW, 55 µm2 DC Process Monitor with Linear Temperature Tracking,"* Ramana Ranganatham, Roberto Ramos-Brito, Tejasvi Das (Rochester Institute of Technology)
- *"Testing Strategies for Ferroelectric BTO Films and BTO-IGZO Ferroelectric FETs for Analog Memory Applications,"* Nicholas Haehn, Connor Socolik, Vamshi Kiran Gogi, Siddharth Barve (University of Cincinnati MIND Lab), Joshua Mayersky (Tokyo Electron), Amber Reed, Kevin Leedy (Air Force Research Lab), Rashmi Jha (University of Cincinnati MIND Lab)
- *"A Generative-Model-Assisted Optimizer for Restoring Transmission Performance,"* Junting Deng, Ethan Chen, Vanessa Chen (Carnegie Mellon University)
- *"Design for Testability of a CMOS Dynamic Bias Comparator for Through-Wafer Two-Photon Absorption Pulsed-Laser Testing,"* Andrew Ash (Oklahoma State University), Ickhyun Song (Hanyang University), John O'Hara, John Hu (Oklahoma State University)
- *"Phase Signal Classification with Reservoir Computing,"* Md Rubel Sarkar, Shirazush Salekin Chowdhury, Jeffrey S. Walling, Yang Yi (Virginia Tech)
- *"Invited: Mixed Signal Approaches to Machine Learning Hardware Accelerator for Inference Engines,"* Bibhu Datta Sahoo, University of Buffalo

Special Session 3: Wideband Gap Technology

- *"28/39 GHz Dual-Band GaN Power Amplifier Design,"* Swarup Chakraborty, Tian Xia (University of Vermont)
- *"Effect of Growth Conditions on the Performance of Vertically Conducting b-Ga2O3 Diodes on 4H-SiC Substrate,"* Nifat Jahan Nipa*, Kai Fu#, Tahir Hassan*, Lee Dongkyu*, Botong Li#, Iftikhar Ahmad (*University of South Carolina, #The University of Utah)
- *"Investigating the Limitations of Desat Protection for WBG Semiconductors: Conjoint Effects due to the Parasitic Inductances, Junction Temperature and Dynamic Drain-Source Resistance,"* Annoy Kumar Das, Tian Qiu, Zheyu Zhang (Rensselaer Polytechnic Institute)
- *"Optimum Design of GaN Superjunction Devices in the Presence of Charge Imbalance,"* Monzurul Alam (North Carolina Agricultural and Technical State University)

Special Session 5: Bioelectronics & Micro/Nano Devices w/ AI Integration

- *"Microelectronics Differential Impedance Spectrometry System: Modeling and Noise Analysis for Biomedical Sensing Applications,"* Muhammad Nabeel Tahir, Umer Hassan (Rutgers the State University of New Jersey)
- *"Thin-Film Hall Sensors for Detecting Micron-Scale Magnetic Particles using a Computational Study,"* Harshitha Govindaraju, Umer Hassan (Rutgers University)
- *" Wafer-Scale 2D MoS2 Transistors Utilizing Location-On-Demand Selective Synthesis,"* Anthony Cabanillas, Chu Te Chen, Fei Yao, Huamin Li (SUNY at Buffalo)
- *"ECG-Driven Automatic Personality Trait Identification,"* Timothy Sweeney-Fanelli, Justin Au-Yeung, Naveenkumar Venkataswamy, Masudul Imtiaz (Clarkson Univ.)

Special Session 6: Emerging Issues in Hardware and System Security

- *"Towards Fuzzing Hardware as Hardware,"* Ruochen Dai, Michael Lee (University of Florida), Patrick Hoey (University of Massachusetts Lowell), Weimin Fu, Xiaolong Guo (Kansas State University), Shuo Wang (University of Florida), Dean Sullivan (University of New Hampshire), Tuba Yavuz (University of Florida), Orlando Arias (University of Massachusetts Lowell)
- *"Securing the Interconnect in Heterogeneous 3DICs: Threats and Emerging Solutions,"* Dipal Halder, Sandip Ray (University of Florida)
- *"Analyz-N: Toolset for hardware security vulnerability detection and mitigation,"* Travis Meade, Raj Dutta (Silicon Assurance)

Special Session 7: Emerging Issues in Hardware and System Security

- *"AI-assisted sensing for system security enhancement using user biometric data,"* Xianglong Feng (Miami University)
- *"Constructing Secure Hardware Datasets to Support the Application of Large Language Models in Hardware Domain,"* Xiaolong Guo, Weimin Fu (Kansas State Univ.)
- *"NIST 800-22 Statistical Validation of SRAM-based PUFs for Hardware Security,"* Zain Ul Abideen (Carnegie Mellon University)
- *"CAPRI6: A Solution for Fault Root Cause Detection,"* Dillibabu Shanmugam, Zhenyuan Liu, Patrick Schaumont, (Worcester Polytechnic Institute)