2024 IEEE INTERNATIONAL RELIABILITY PHYSICS SYMPOSIUM
Call for Papers
April 14th – 18th, 2024, Hilton DFW Lakes, Dallas, TX USA

IRPS is the preeminent conference for timely research on Reliability Physics of devices, circuits, products, and systems used in the electronics industry; Reliability challenges and solutions are discussed here first.

Abstract submission due October 22, 2023

IRPS 2024 focus topics:

1. **GAA, nanosheet, RibbonFET™, Forksheets, SiGe Channels:** TDDB, BTI, HCI, high voltage effects
2. **3D packaging and heterogeneous integration**: 3D, enhanced 2D, chiplets, Si bridge, interposer, RDL technology, hybrid bonding, micro-bump, Cu-pillar and other interconnects
3. **Reliability-aware EDA**: device physics to circuit and systems, reliability in DTCO, electromigration assessments, thermal characterization, logic, memory, high-reliability applications

Papers in the Following Areas are Requested

Circuits, Products, and Systems

- **Circuit Reliability and Aging** – Includes digital and analog circuit design for reliability, aging assessments and compact models from circuits to systems; use of EDA tools; radiation and electromagnetic effects on fresh and aged chips.
- **ESD and Latchup** - Component and system-level ESD design, development and characterization. Latchup detection, prevention and mitigation. Includes numerical modeling, physics, simulation, troubleshooting and FA.
- **Packaging and 2.5D/3D Assembly** – Includes chip-package interaction; fatigue; power dissipation issues; reliability of 2.5D and 3D IC packaging and integration, interconnects, multichip modules, passive interposers
- **Product Reliability** – Chip level reliability modeling, DFR, reliability aware design/monitor, EDA solution, reliability validation from Pre-Si to Post-Si for SOC, Chiplet, MCM and SIP; electrical, thermal, mechanical risk and electromagnetic effect for products in various markets.
- **Radiation Effects Reliability** – Includes basic mechanism and impact analysis of radiation effects on components and systems; Component, system and application-level modeling, simulation, testing, and mitigation techniques for radiation effects induced reliability issues.
- **Reliability Testing** – Includes reliability test development and design, new methodologies, novel analysis methods and techniques, reliability physics and failure mechanism, reliability test equipment, tools, and test structures.
- **RF/mmW/5G** – RF reliability test and modeling of CMOS, BiCMOS, SiGe, GaN, III-V devices for GHz and THz applications for devices such as PA, LNA, mixers, and high-speed switches. Reliability of novel materials and device architectures for RF/mmW/5G and beyond.
- **System Electronics Reliability** – Reliability of electronic systems used in consumer electronics, data centers, health care, space, automotive, etc.; architecture, design, modeling, telemetry, electromagnetic effects, and large-scale analysis techniques such as machine and deep learning.

Materials, Processing, and Devices

- **Emerging Memory** – Novel memory devices based on magnetics (e.g., STT, SOT, VCMA), or resistive (selector or memory element) RAM, ferroelectrics, or phase change memory for eNVM or stand-alone applications.
- **Failure Analysis** – Includes evidence of new failure mechanisms; advances in failure analysis techniques
- **GaN Devices and SiC Devices** – threshold voltage instabilities, charge trapping, switching stress, breakdown and other reliability topics including thermal issues within power devices.
- **Gate/MOL Dielectrics** – Includes reliability of novel gate dielectrics, ferroelectrics, III-V, Ge, and advanced FETs; 2D layered dielectrics and van der Waals dielectrics; modeling of dielectric breakdown; middle-of-the-line reliability; MIM/MOM capacitors
- **Memory Reliability** – Includes stand-alone volatile memories (SRAM, DRAM), planar and 3D NAND Flash memories, embedded memories (stand-alone and on-chip) and SSDs.
- **Metallization/BEOL Reliability** – Includes electro-migration; Joule heating; stress migration; low-k dielectric breakdown
- **Neuromorphic Computing Reliability** – Reliability of logic and memory (MRAM, RRAM, PCM, Ferroelectrics, Flash, etc.) devices, and their interactions with materials, circuits, architectures, and algorithms used in NC and AI.
- **Process Integration** – Includes manufacturing process such as PID/charging, anneals/implants etc. impact on component reliability, existing and new process-related reliability issues in production; foundry reliability challenges
- **Transistors** – Includes hot carrier phenomena; BTI; RTN; advanced node scaling; variability; Ge and III-V channels; nano-wire, gate all-around, nano-ribbon, fork-sheet devices

Preparation of your manuscript

Your two-page original abstract submission should clearly and concisely present specific results and explain the importance of your work in the context of prior work. Use document template available at www.irps.org. Full manuscripts of accepted papers will be due before the conference. Registration for the conference is required for the author presenting the paper.

Late Paper Submission

Full-length manuscripts with significant late breaking news submissions **due January 29, 2024.**

Agreement Not to Pre-Publish Abstracts or Present Abstracts

Submission of an abstract for review and subsequent acceptance is considered by the committee as an agreement that the work will not be placed in the public domain by the author prior to the conference. Accepted papers or significant portions of the work may not be placed in the public domain (conference with and without proceedings) prior to the conference. Violation will be grounds for automatic withdrawal of the paper by the conference committee. All questions or inquiries for further information regarding this meeting should be directed to the **IRPS Contacts**.

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